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Quotable

"People are saying they are postponing purchases while they wait for the repository. IBM will say, 'Don't wait, start today.'"

A third-party software vendor commenting on IBM's application development strategy. See story page 1.

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The city of Stamford's IS department has to do much more work with limited resources. Page 25.



Publishers of Farm Journal and other magazines are clucking over their ability to customize editions with database and printing technologies. Page 55.

EXECUTIVE BRIEFING

■ Telecommunications technology has become so important to a company's competitive performance today that increased effort must be made to find the right person for the position. The new breed of telecom manager is a special kind of individual, one who must possess the talent to work both within the IS and telecom domains and outside of them. The IS group can encourage this balanced role and groom a successful telecom manager. Page 73.

■ There is mixed news for IS executives from the salary front. On a positive note, many executives earn more than \$100,000, with some nearing the magical \$1 million plateau, according to the annual *Computerworld* salary survey. But the bad news is that salary levels fall off sharply for IS executives outside of high-visibility positions, which draws the average salary for CIOs and IS vice-presidents down to \$89,158. Page 63.

■ IBM will try to clear the air around its repository project Sept. 19 when it rolls out AD/Cycle, an applications development environment that builds on Systems Application Architecture. IBM's intent is to automate the building of applications across the entire development cycle and protect customer investments in IBM development tools. Three computer-aided software engineering organizations will share center stage with IBM. Page 1.

■ System/36 users will be wooed by IBM's Application System/400 introductions this week, as the models will lower the entry point for those customers seeking to upgrade. The much-awaited AS/400 tape drive is also expected. But don't expect the company's new version of the RT workstation until the first quarter of next year. While the hardware may be nearly ready, third-party software and field support are not. Page 109.

■ The linkage between information systems and the business side is a concern in many companies. Cigna Corp. is doing something about it, carrying out a \$2 billion, five-year plan known as Technology Linkage. The project is Cigna Systems President J. Raymond Caron's attempt to ensure that Cigna's technology investments benefit the business. Page 55.

■ The publishing world is finding new ways to use information technology. Sophisticated databases and other tools allow publishers to try techniques such as customized advertising targeted at special-interest readers. Page 55.

■ It may be the last stand for graphics supercomputers as Ardent and Stellar agree to merge, forming — you guessed it — Stardent. Both companies have been beleaguered by poor sales resulting from a lack of software and network bottlenecks. Page 8.

■ Managing the illegal alien problem is going high-tech. The U.S. Department of Justice Immigration and Naturalization Service is increasing its dependence on computers, particularly image processing, as it implements a new "green card" system. Page 4.

■ Meanwhile, white-collar immigrants who can play an important role in the computer industry and information systems may be turned away from the U.S. if the federal government doesn't relax its immigration policies, according to speakers at a recent Silicon Valley conference. Page 63.

■ IS managers should understand business operations for at least two reasons. First, the use of technology there can be critical for competitiveness. Second, operations managers may be stuck in a traditional mode, leaving it to IS professionals to rethink and redesign processes. Page 66.

F UPDATE
or \$25 a few years ago, enterprising galactic hawkers would name a star in your honor. Then came the ambitious New Yorker who began selling lots of land on the moon and on Mars (heck, no one else laid claim to those parcels). Now from Kodak comes the KIMS 4000, a document management system that lets private citizens send personal messages and scanned images into outer space. Astronaut Ellen Baker will carry a message-laden optical disc on her space shuttle trip on Columbus Day and send the Orbitgrams — honest, that's what they're called — into interstellar ether. No X-rated stick figures, please.

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COMPUTER
ASSOCIATES

'Green' cards keyed to optical database

BY ELLIS BOOKER
CIVIL SERVICE

WASHINGTON, D.C. — The U.S. Immigration and Naturalization Service (INS) began distributing a new version of its resident alien identification card late last month that is keyed to an optical database containing the cardholder's photograph, signature and fingerprint.

The card and optical database replace a card-production system implemented in 1977. That

card, known within the INS as the 1551, was a response to counterfeiters and was the first to carry a color photograph, fine-line engraving, a black-and-white fingerprint and a machine-readable optical character recognition (OCR) code, according to William M. Kemper, who directs the INS Immigration Card Facility in the Dallas/Fort Worth area.

Kemper explained that the ostensible reason for the latest card was again to defeat fraud.

EDS manages cards

Last September, General Motors Corp. subsidiary Electronic Data Systems, Inc. won the bid for a systems integrator and facilities manager at the INS Dallas center. EDS installed a state-of-the-art high-security document production machine from Thomson-CSF, a French company that also supplies the equipment used to produce the French national identification card.

The front end of the Thomson equipment is a Bull H. Information Systems, Inc. DPF 7000 Model 20. This mainframe manages image data, and another mainframe at a Dallas EDS facility maintains textual data. A single Sun Microsystems, Inc. 386i workstation at the card production facility in the Bull computer room accesses and merges the text data from the EDS host and image data from the Bull host.

The new configuration automates card production by using image-capturing equipment to scan the paper application and record three images: fingerprint, photograph and signature. This image data is in turn stored on a jukebox from Exvers subsidiary Cymet Technologies.

ELLIS BOOKER

Prime

FROM PAGE 1

up front and in person.

"Their plans sound promising," Hernandez said, referring to J. H. Whitney & Co., the New York-based venture capital firm that acquired Prime late last month, and James McDonald, the former Gould Corp. chief executive whom Whitney immediately appointed chief executive officer. "But it's easy to make promises. I want to see how much they are really interested in doing for their customers."

McDonald and Whitney partner Russell Panitzter, Prime's chairman-designate, emphasized in their earliest official addresses that the shape Prime takes will be employee-concerned and company-driven. "I'll be at company headquarters next week to go into some detail with them and see, for instance, whether they will be considering [alternatives such as] strategic alliances with customers," Hernandez said.

At Eaglewood, Colo.-based Hoty Corp., information sys-

tems director David Long found cause for relief in the Whitney buyout and grounds for hope in McDonald's outline of a restructured company that will continue to support and enhance Prime's current core product lines.

"After eight years as a Prime user, our investment is substantial. And we're looking at a major upgrade right now, so we've been watching the developments at Prime pretty closely,"

Long said.

Hoty, an approximately \$30 million privately held manufacturer of cleaning equipment with three U.S.-based facilities and one in Italy, has been using Prime systems for a variety of business and manufacturing applications. The company is now looking to add computer-aided design, Long said.

The prospect of a Prime takeover and breakup of its compo-

nents by Chairman Bennett LeBow and MAI Basic Four, Inc. sent waves of apprehension through his department, Long said. Once Whitney takes Prime private, he said, "they won't have to worry about something like this happening again, and neither will we."

Not all reports were so halcyon. "I couldn't care less what happens to Prime — we're not users any more," said the director of computing services at a Midwestern university branch who asked that his identity not be disclosed. Once a Prime site, his employer switched to "a mixed bag of personal computers" serviced by an internal maintenance department — not so much out of disappointment in Prime technology, the computing services director said, but in disgust at what he said was derelict Prime service.

Would his department consider dealing with Prime in its new incarnation? The door is not barred, he said, but it will not swing open easily. "We'd have to see them create a history of good service," he said.



INS Inspector checks driver's documentation

"In 1986, we started to see some counterfeits, and we undertook a study to beef up the security features," he said.

A second motivation for upgrading the 12-year-old system, Kemper said, was the simple need for more production capacity. A resident alien amnesty bill passed by Congress in 1986 prompted a deluge of illegal aliens to apply for cards before the program deadlines in May and November of this year. The INS recorded 3.1 million applicants as a result of the program. As Kemper put it, "Instead of making one million cards a year, we now do two [million]."

According to INS figures, approximately 400,000 new immigrants arrive in the U.S. each year seeking permanent resident status; another 100,000 apply to change their assignment. In addition, the agency issues 200,000 "border-crossing" cards each year to Mexican citizens for 72-hour trips just inside the U.S. border.

With optical disc storage, the INS could use a computerized

fingerprint identification technology known as Automated Fingerprint Identification System, or AFIS, which is becoming increasingly popular at local and state law enforcement agencies.

INS' Kemper allows that an AFIS setup is a possibility, but he did not say when or if such technology would be deployed in the INS image database. Kemper did say that a project is under way to decentralize the card-processing operation, now based in Dallas.

Another innovation is that a card's lifetime in the database will be restricted to one decade, after which the holders will have to apply for new identification. The INS estimates there are 10 million of its laminated blue and white ID cards — popularly, if inaccurately, called "green cards," because the INS has not used that color since the 1960s — in use in the country, and the color scheme will change again with the latest cards. The cards, which will use an international OCR code for the first time, will cost less than \$5 per card to produce, according to INS officials.

COMPUTERWORLD

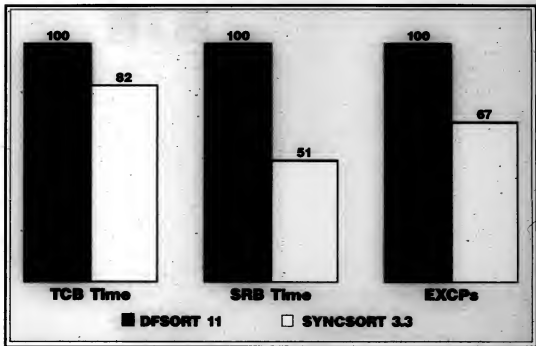
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NEWS SHORTS

What did you do last week?

It was a week for records in the mathematics community. Columbia University scientists and brothers Gregory V. and David V. Chudnovsky claimed a world's record by calculating of over a billion places, more than twice the 480 million places the pair had recorded in June. They used a pair of IBM 3090 supercomputers at IBM's Thomas Watson Research Center and the experimental IBM Scriptacore automated algebra system to complete the feat. As if that weren't enough, six researchers at Andalski Corp. announced they have found the largest known prime number — one that contains 65,087 digits. A prime number is any whole number greater than 1 that can be divided only by 1 or itself without producing a remainder. Some small prime numbers are 2, 3, 5, 7, 11 and 13.

Anderson takes a shine to Wang

Anderson Consulting will remark Wang Laboratories, Inc. imaging products under a nonexclusive agreement announced by the two firms last week. As a value-added reseller, Anderson will provide consulting, implement software applications and develop custom-designed imaging-based applications for Wang Integrated Image Systems. Wang also unwrapped four personal computers based on Intel Corp. 80286 and 80386SX chips. The PCs include three systems using the IBM AT bus architecture, as well as Wang's first IBM Micro Channel Architecture-compatible offering. Pricing on the new PCs starts at \$2,995. Wang's micro efforts have been plagued in the past by charges of proprietary systems, so last week's unveiling included a "statement of support" from Intel, certifying that the new Wang boxes are indeed standard offerings. Wang also announced MS-DOS 4.01 for all four systems and OS/2 Release 1.1, including IBM and Microsoft Corp.'s OS/2 Presentation Manager, for its AT-based system.

Progress on phone talks

There were more settlements in the strikes against the divest of Bell operating companies last week. As of midnight, all of the Communications Workers of America (CWA) and International Brotherhood of Electrical Workers (IBEW) members had agreed to tentative contracts with Ameritech Corp. At Bell Atlantic Corp., settlements had been reached with the CWA, but the IBEW continued to strike against New Jersey Bell. Meanwhile, at Nynex Corp., CWA members and IBEW representatives were back at the negotiating table with Nynex management representatives. Those groups had not met since the strike began Aug. 5, but no settlements have been reached by either group.

SBA is first data user on FTS-2000

The U.S. Small Business Administration (SBA) has become the first data communications customer to sign up for Federal Telecommunications Service 2000 (FTS-2000), the government's new intercity network, according to an announcement made last week by U.S. Dept. of Communications Co., the federal contractor handling 49% of FTS-2000 traffic. The SBA's custom data network, valued at \$7 million over 10 years, will link the agency's 10 regional centers with more than 100 field offices.

Texas Air loses United suit

The computer reservation system (CRS) wars are heating up again — this time in court. A federal judge in New York last week dismissed System One Direct Access, Inc.'s claim that United Airlines had engaged in anticompetitive practices by discouraging travel agents from using its system, called System One. United Airlines is an owner of Corvia, which markets the Apollo CRS. System One Direct is an affiliate of Texas Air Corp. Further, because of a contract breach by United, the judge ordered 20 travel agents that had broken their contracts with Apollo in favor of System One to pay damages to United. "The interesting thing is that Texas Air would rather fight in the courts than in the marketplace," said Barry Kotler, president and chief executive officer of Corvia. "They have a number of suits filed against us for various reasons."

Reynolds wrapping it up

Following eclectic career, Hughes Aircraft vice-president makes his exit

BY CHARLES WEN SIMSON
OF STAFF

Carl Reynolds, staff vice-president of communications and data processing at Hughes Aircraft Corp., will retire Oct. 1, after more than 18 years as the MIS director at one of the nation's premier technology companies.

"I will be leaving Hughes to pursue a number of other projects and interests," Reynolds said last week, adding that he may enter the ranks of IS consultants.

Reynolds has spent nearly 37 years in the computer industry, where he was employed in a wide range of positions. In many ways, the evolution of his eclectic career traces the evolution of the industry itself.

Reynolds joined Hughes Aircraft as director of data processing in 1971, at a time when the concepts of strategic systems and gaining competitive advantage through technology usually received no more than a polite nod out of most chief executive

officers. He was promoted to his current title in 1982 and oversaw a budget surpassing \$100 million.



Hughes' Reynolds leaving the company after 18 years

Prior to working at Hughes Aircraft, Reynolds made the transition from pure scientist to entrepreneur to salesman to IS manager; these changes would come to characterize the entire

computer industry. After graduating from Harvard University in 1945 and serving with the U.S. Marines, Reynolds joined the staff of the Woods Hole Oceanographic Institute. He received a master's degree in physics from Brown University and worked at the Naval Ordnance Laboratory in Washington, D.C., before becoming an applied mathematician at Goodyear Aircraft in Akron, Ohio.

In 1952, Reynolds became manager of what was known as the company's Analog Computer Laboratory. He then joined IBM in 1959 and held several positions at that company, including manager of systems programming for the systems development division, until he left in 1966.

Between 1966 and 1970, Reynolds worked with several small software firms. In 1971, he joined Hughes as corporate staff director of computing and data processing. A successor for Reynolds has not yet been named.

HP New Wave 'agent' missing in action so far

BY JEAN S. BOZMAN
OF STAFF

CUPERTINO, Calif. — When Hewlett-Packard Co. ships its release of the New Wave object-oriented personal computer environment to end users this week, it will not have full use of its much-touted "agents" facility, the company said last week.

The agent is intended to act as a facilitator that can automate repetitive tasks such as logging on to remote computers.

"Conceptually, the agent is your personal assistant," said Glenn Stearns, research and development manager of the agent product at HP. "Think of it as a software robot inside your computer. It uses your computer and software just like you do."

However, users will have to wait for the second release of New Wave, scheduled for the first quarter of 1990, before they see the agent features commonly demonstrated to industry analysts and the press. That is because software for the agent was not tested in time for inclusion in the first release.

"We actually finished the agent facility this summer, but there wasn't time to get it into our systems integration and testing schedule," said Steve Grey, product manager of New Wave, which is being marketed

by Hewlett-Packard's Information Systems Group.

The first New Wave product, Release 1.0, is being shipped to HP's direct-sales force this week. However, copies of New Wave will not appear in retail stores until November and possibly not until Feb. 1, Grey said. Meanwhile, about 50 independent software developers already have copies of New Wave's second release.

The New Wave Developer's Kit, which contains full agent features, will assist developers in meeting the New Wave Release 2.0 requirements, according to HP.

Hot stuff

Despite the agent limitation, one early New Wave user says the agent is only part of the New Wave look and feel. The other part, which "hot-links" data in separate applications, is also important, said Rod Morgan, staff manager of systems support at US West in Phoenix, one of 200 New Wave beta-test sites.

In the first release of New Wave, the agent will only be able to "launch" a scripted series of actions such as dialing a modem. "The first release of the agent is limited, with the agent being able to launch scripts for applications that have scripted languages built-in," Grey said.

In the second release, the agent will be able to re-create an end user's on-screen actions. In this way, for example, reports could be updated with new information and sent out in the end user's absence. A Lotus Development Corp. 1-2-3 spreadsheet, one of 245 DOS programs supported by New Wave, could be updated overnight when the agent dials up a remote computer.

Some industry analysts were concerned last week that memory restrictions would cripple the agent's effectiveness, even in New Wave Release 2.0.

New Wave is an extension of Microsoft Corp.'s Windows 2.1.1, which is scheduled to get improved memory management next year. With the current version of Windows, certain agent tasks might exceed a PC's capacity, prompting an "out-of-memory" message, HP managers said. "HP gets the 'Red Badge of Courage' for trying to shoehorn New Wave into the current release of Windows," said John McCarthy, director of professional systems research at Forrester Research, Inc., in Cambridge, Mass. "Like every other vendor, they look forward to Microsoft Windows 3.0, which will free up more memory so you can put more functions into a Windows-based product."

HP says there is no memory problem, however. "The agent requires no more memory than New Wave itself," Grey said. "The minimum configuration for New Wave is a system with 3M bytes of expanded memory."

3Com tries to polish image with server line

BY CHARLES VON SIMSON
CIVIL STAFF

3Com Corp. Chairman Bill Krause climbed into the bully pulpit last week in an effort to generate enthusiasm for the newest Intel Corp. 80386-based upgrade to the firm's network server line as well as several new software packages.

Krause claimed that the new systems demonstrated "why a company with a less-than-stellar stock record could be so optimistic." Analysts, however, were guarded about the prospects for the new products.

The dedicated 35/500 network server, based on the 80386 chip, will include expanded memory and security features and offer a number of architectural enhancements aimed at maximizing network performance.

Analysts were optimistic about the machine's prospects in the personal computer

server market, particularly coupled with the firm's 3+Open operating system, but they remained cool on its near-term significance to 3Com.

"The server represents a solid system sale for 3Com," said Alice Brasie, network analyst for Hambrecht & Quist, Inc. in New York. However, she added, "It is not the answer to the company's near-term problem, but I believe it is the right bet to be making."

At the same meeting, 3Com made the obligatory announcements that it would ship new IBM Systems Network Architecture (SNA) gateway and X.25 products in October (see story page 45).

Capitalizing on a niche that it believes has been left unexploited by IBM, 3Com will offer an IBM-compatible gateway for DOS clients and OS/2 servers as part of its Maxnet SNA gateway product line. The new X.25 gateway server will allow connections between Ethernet, Token Ring or broadband LANs and public data networks via standard Xerox Corp. network systems, Transmission Control Protocol/Internet Protocol (TCP/IP) or Open Systems Interconnect (OSI).

Analysts were unenthusiastic about the new products but said that they may be necessary for systems sales. They also cautioned that IBM, Novell, Inc. and oth-

ers offer products in the area.

"They are not selling systems software, and now they are entering a market with an intense amount of competition," said Peter Corrigan, president of the Corrigan Group. "They need to be very careful they don't get blindsided. These are all things that are addressed by Novell and IBM."

The firm also announced that it will ship a 3+Open TCP product that will include 3Com's demand protocol architecture (DPA) in October. The TCP product will allow DOS- and OS/2-based PCs to share resources over TCP/IP networks. DPA, available now, allows workstations to load multiple protocols as needed to access servers running OS/2, Unix, VMS and OSI.

Novell ships out first-phase copies of Netware 386

BY CHARLES VON SIMSON
CIVIL STAFF

Novell, Inc. announced last week that it has shipped the first production copies of Netware 386 Version 3.0.

The newest version of the firm's network operating system, optimized for Intel Corp. 80386-based servers, had been in beta testing for several months and received a strong reception from early users.

Analysts, however, were critical of the fact that the operating system lacks some of the functionality of the company's lower end Advanced Netware product.

Version 3.0 will not support Transmission Control Protocol/Internet Protocol or the Apple Computer, Inc. AppleLink communications protocol. Those functions are promised for Version 3.1, which is expected to ship in the first quarter of 1990. "It is not a complete product," said David Perrow, a network analyst at Dataquest, Inc. "They are in a ball game where the higher end products are faster but provide less functionality than the lower end systems."

Despite the missing functions, beta-test users of Netware Version 3.0 gave Novell high marks for the new release, saying that the system ran smoothly over a variety of 386 hardware platforms with minimal, quickly corrected bugs.

"We had some early minor problems," said Gregg Scott, network manager at Oregon State University, which ran the operating system on Hewlett-Packard Co. Vectra RS20 servers. "But we had excellent access to engineering people, and they were all straightened out. That is what the beta process is for."

Version 3.0 supports 250 users on DOS, OS/2 or Apple Macintosh platforms and is upwardly compatible with Netware Version 2.1 and later editions. It is also compatible with the company's Netware for the Macintosh products. Novell will offer free upgrades to Version 3.1.

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Stellar, Ardent take one orbit

BY JAMES DALY
OF WASH.

NEW YORK — Ultimately, the companies that could make a three-dimensional image of a target (well, efforts across a computer screen) could not put the same spin on their own operations.

So with backhanded sales and a fiercely competitive market staring them in the face, struggling graphics supercomputer rivals Ardent Computer Corp. and Stellar Computer, Inc. moved to save themselves from extinction last week and announced plans to merge.

The union, which is expected to be finalized by mid-October, brings together Stellar's top executive John William Podusko and Ardent's chief operating officer H. Michaels. The veteran computer entrepreneurs will serve as interim co-chairmen and co-chief executive officers of the new company, to be named Star-

dent Computer, Inc.

"The wealth of our products created confusion and made it difficult for customers to choose," Michaels said. "The choice is now dramatically clear."

Both Michaels and Podusko said no immediate staff cuts were planned among the combined firms' 400 employees and that a fully integrated product line is expected to be ready by the first half of 1991. In the meantime, Newton, Mass.-based Stellar and Sunnyvale, Calif.-based Ardent will continue to maintain offices at separate costs.

The move adds an interesting chapter to the brief and turbulent graphics supercomputer story. When the companies began shipping products within weeks of each other last spring, their potential seemed enormous. Stellar's GS10000 and Ardent's Titan boasted eye-popping graphics and processing power that carved through the

most compute-intensive applications, making the single-user machines a natural bridge between high-end workstations and minisupercomputers.

However, the products never fully caught on. Networking bottlenecks, a lack of wide-ranging software and an entry-level price that once topped \$100,000 bridled growth. Both companies had difficulty maintaining market share, each garnered sales of only around \$12.5 million last year, according to International Data Corp. estimates.

"The Ardent-Stellar situation was a classic case of mutually assured destruction," said Laurin Herr, president of Pacific Interlink, Inc., a New York-based computer graphics consulting firm.

To date, Stellar has sold about 250 computers, while Ardent has shipped about 400. "While that's acceptable, it's just not enough to support a busi-

ness," one Ardent official said.

Michels said a merger was discussed in late 1985, when both companies were floundering, but that notion was dismissed because the firms were located on opposite coasts.

A sole chief executive of Stardent will eventually be named, Michaels said, because the concept of co-chairmen and co-CEOs "is absolutely ludicrous, but we need it for transitional purposes."

Privately, some analysts questioned the high-fives and conviviality of the strong-willed executives exhibited during the announcement. Both men have experience

with start-ups: Podusko founded Apollo Computer, Inc. and Prime Computer, Inc., and Michaels started Convergent Technologies, Inc. — and are skilled in the ways of gaining and holding corporate control.

When the team solidifies, however, they will point their significant resources outward instead of at each other. "It's a clear case of two and two adding up to five," Podusko claimed.

Planned efficiencies in research and development, manufacturing, marketing, sales and support will help in an attack against well-entrenched competitors such as Silicon Graphics, Inc., Hewlett-Packard Co., Tektronix, Inc. and AT&T's Pixel Machines division, he said.

Stellar phaseout

All of Stardent's machines will eventually be made at Ardent's current manufacturing, Japanese conglomerate Kubota Ltd., while Stellar's manufacturing facilities will be phased out. Forty-four percent of Ardent is now owned by Kubota, while Stellar is privately financed. Kubota will be the largest single shareholder in Stardent, with 22% of the new company.

At least one user was pleased with the news of the impending union. "The two companies' products" are essentially very different architectures, so I'm delighted that the resources of both companies will now be at my fingertips," said Jack Dongarra, who uses both Stellar and Ardent machines at Argonne National Laboratories in Argonne, Ill. "The bad side, however, is that this narrows the competition, which is never a good thing."



Ardent's Michaels



Stellar's Podusko

Star Wars

FROM PAGE 1

resources and collaborate with one another at real LAN speeds, according to Mark Zonca, electrical engineer at the Rome Air Development Center in New York, which is coordinating the project.

However, civilian users may get their hands on the fruits of this research even faster than military researchers. Zonca said. While the two military groups' initial goal is to have a prototype system for evaluation by January 1990, he said, several leading inter-networking vendors that are involved in the effort could bring their high-speed routers to market within a year (see right).

Vanishing bandwidth

This would be welcome news to users whose traffic has grown beyond the typical 1.5M bit/sec. capacity of the current crop of routers and bridges.

"When you put in bridges, take 10M bit/sec. LAN speeds and squish them down to 1.5M bit/sec. T1 speeds, you're run out of [bandwidth] capacity real soon," said Jack Covett, a scientist at Hughes Aircraft Co.

An early implementer of a variety of remote LAN bridges and routers, Hughes did a responsiveness study that found that 1.5M bit/sec. devices "start to degrade real rapidly" whenever three to five users tried to transfer files at the same time, Covett said.

Three independent contractors are developing products for the military: SRI International, which has brought in Cisco Systems, Inc. as a subcontractor; GTE Government Systems Corp., which has brought in Proteon, Inc.; and BBN Communications Corp.

The military's push toward higher speed LAN interconnectivity is part of a larger effort to boost the speed with which various U.S. research groups can collaborate with one another and access supercomputing resources throughout the country (CW, Aug. 14).

An effort is now under way to interconnect researchers' systems with one another and with computing resources throughout the country over a high-speed backbone. The backbone network currently supports T1 speeds but will migrate next year to rates of 45M bit/sec. and eventually to 1G or 2G bit/sec. The military has commissioned vendors to provide a parallel migration path for LAN interconnectivity devices, from current T1 speeds up to 100M bit/sec., a BBN spokesman said.

However, such devices constitute just one of several elements needed to support fast links between remote LANs, and long-distance connections that support 6M bit/sec. or more. Right now, carriers such as AT&T provide 1.5M bit/sec. T1 links and 45M bit/sec. T3 links — and nothing in between.

While the increasing availability of T3 links has helped drive the LAN interconnectivity market, users must still pay for the full T3 line, according to Covett.

Missing link

Another missing piece is the T3 multiplexer that can act as a liaison between the LAN intercon-

nectivity device and the carrier's service. Network Equipment Technologies, Inc. (NET), one of the first T1 switch vendors to announce a T3 switch, is working on an interface that would interconnect LANs at 6M bit/sec. or perhaps even 10M bit/sec., Covett said, "which would be wonderful and a logical move for

us, since we already use NET equipment."

While refusing to confirm or deny such a project, a NET spokesman conceded that such a capability would be "logical extension" of NET's current development efforts to marry its T1 technology with bridge routers from Cisco Systems, Inc.

Speed racers

Military funding has apparently accelerated existing vendor efforts to develop high-speed routers; however, several participants said they have been working on such products all along and are, indeed, on the verge of bringing them to market.

Vendors that are developing such devices for the Joint Strategic Defense Initiative Department of Defense project are also gearing up for a variety of commercial introductions, which include the following:

- Cisco Systems, Inc. plans within the next couple of months to announce devices to interconnect 100M bit/sec. Fiber Distributed Data Interface (FDDI) networks at 10 times the throughput of its existing products, a company spokesman said.

- The Menlo Park, Calif., vendor's current bridge router line is said to deliver 10,000 packets/sec., which is enough throughput to support typical Ethernet local-area network speeds of 6M bit/sec. across a remote link without any noticeable degradation, several industry sources said.

- BBN Communications Corp. will announce a

commercial version of the high-speed router it is developing for the military. "It is safe to say it is within a year," said company spokesman Jeffrey Palmer.

• Proteon, Inc. is involved both in the SDI-Internet project and a related project for the National Aeronautics and Space Administration to develop a prototype router that will switch at least 25,000 packets/sec., according to Proteon Chief Executive Officer Howard Salwen.

Proteon expects to take "more than a year" to introduce a commercial version of the product, which will be able to handle traffic between FDDI networks that run at 100M bit/sec., he added. Recently, Cryptolite Communications Corp., in Cranston, R.I., announced the 3000 Series Ethernet bridge, which is said to support a throughput of between 7.3K and 8K packets/sec.

The currently available version of the bridge supports remote connections over 1.5M bit/sec. T1 speeds, but an introduction slated for this month will support 6.3M bit/sec. remote connections over a group of four T1 links, according to Cryptolite President Jeffrey Weiss.

ELISABETH HOWITT



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Meridian plan throws in towel

BY ELISABETH HOKWITT
OF STAFF

RICHARDSON, Texas — Introduced eight months ago as the last word in multivendor connectivity, Northern Telecom, Inc.'s Meridian Data Networking Sys-

tem (DNS) had died a natural death from user neglect.

The product, just taken off the market, represents the latest in a series of unsuccessful attempts by Northern Telecom to expand beyond its voice-oriented private branch exchange

(PBX) and central-office switch niches into the data communications business.

Within the next 30 to 45 days, according to company spokesman Mark Beauford, Northern Telecom will announce plans to provide "the same functionality

DNS brought to the table but on an industry-standard platform." This strategy will target users who "already have [the platform] and would get more out of it than just DNS functionality," Beauford said.

Although no final decision has been made, Hewlett-Packard Co.'s Unix-based minicomputer line is a likely platform, he said.

Announced last October,

DNS was said to interconnect a wide range of local-area networks, hosts, PBX systems and workstations into one corporate-wide, integrally managed network. But even though the product had generated only \$20 million in orders by the time of its demise, Northern Telecom has not abandoned its dream of selling a catchall communications system, Beauford said.

DNS, which one consultant described as "dead before it hit the streets," failed to sell primarily because it required customers to buy a proprietary platform that could not be used for anything else, Beauford said.

DNS' few current users will continue to get the same functionality they now enjoy, although they may have to migrate to a system whose "pieces may be different from the original," Beauford said.

"Northern told us that what we will have [with the new system] will be more functional," said Dennis Diem, co-director of district computer services at the Palm Beach County School System.

The school is in the process of implementing DNS both as a gateway between IBM Personal Computer and terminal users and the school's IBM mainframe and as a minicomputer to run a school management package, Diem said. DNS may also bridge to long-distance links, he said.

A platform based on hardware "that is an established force out there" and a more standardized Unix version "would give us more of a software base to choose from," Diem said.

Up in the air

Still in question, however, is whether Northern Telecom can develop a multipurpose system that can compete in terms of price and performance with devices that are optimized for just one networking function. A number of early users were not happy with DNS, according to Fred Chasowski, an analyst at telecommunications management firm, a Needham Heights, Mass., research firm.

For example, Newark, Del.-based Delmarva Power killed plans for implementing the system after DNS did not provide expected throughput improvements as an IBM mainframe front end, a Delmarva spokesman said.

Ironically, Northern's announcement came only two weeks after Intel Corp. announced plans to make a big splash in the multivendor connectivity platform market with an essentially proprietary system developed by Intel's recently acquired subsidiary, Jupiter Technology (see story page 45). Other competitors include Computer Communications, Inc. and AT&T with its Detaskit and Information Systems Network.

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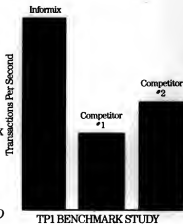
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Subsidizing charge against Singapore could set precedent

BY AMY CORTISE
CW STAFF

In a ground-breaking case being watched carefully by the software industry, the U.S. Department of Commerce's International Trade Association ruled last week that it would pursue an investigation of the Singapore government and Woodcliff, N.J.-based computer-aided software engineering (CASE) vendor CSA, Inc. for unfair trade practices.

The petition, filed by Visible Systems Corp., a CSA competitor, charged that the Singapore government subsidized the development of the Picture-Oriented Software Environment (POSE) CASE tool marketed by CSA, Inc., which is a subsidiary of CSA Pte. Ltd. of Singapore.

A spokeswoman for the Department of Commerce said a preliminary determination on the case would be made Nov. 2.

The case is being watched closely by the software industry because it is likely

to set a precedent in an untested area of trade law. Because software is considered intellectual property, the trade laws and countermeasures that apply to imported goods — tangibles such as computers or steel — do not apply to it. "Software does not come off a ship; it circumvents that," said Cedric Nash, international sales manager for Visible Systems.

Adaptex, the software trade association, has released a statement saying that it commends the Commerce Department's decision to pursue the case and that the outcome would be an "important precedent in determining the treatment of computer software under U.S. trade policy."

In its petition, Visible alleges that the Singapore government developed the

POSE software program sold by CSA, which, it claims, constitutes a product development subsidy. The company also charges that CSA is benefiting from ongoing subsidies from the government in the form of research and development assistance and grants.

Sherman Drusin, president of the U.S.-based CSA subsidiary, denied the allegations. Although he conceded that the product was developed by the National Computer Board, a Singapore government agency, Drusin said that CSA was awarded the rights to commercialize the product in a competitive bid in 1986. As part of that effort, CSA invested millions of dollars in development to bring the product to marketable form, he maintained.



The sun is rising on IPM's new UPS.



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Compaq recasts 386 products, slashes prices

BY PATRICIA KEEFE
CW STAFF

HOUSTON — Compaq Computer Corp. unveiled price cuts ranging from \$300 to \$1,300 on the suggested retail prices of its Deskpro 386/25 and 386/20E product lines last week.

The personal computer maker also slashed \$1,000 off the sticker price of two fixed disk drive options: the 110M-byte drive now costs \$1,799, and the 843M-byte model costs \$1,399.

In addition, Compaq beefed up its Intel Corp. 80386 offerings with the introduction of the Deskpro 386/25 Model 84.

The price cuts, the first ever for the Deskpro 386 models, were enacted to ensure that Compaq maintain a competitive position in the 386 market, according to Mike Swavely, president of Compaq North America.

"I'm surprised they didn't cut prices before," said Mike Davis, an analyst at Lovett Mitchell in Dallas.

A spokesman for Compaq noted that the Deskpro 386/25 and 386/20E are 14 months and 11 months old, respectively, adding that price cuts of 20% to 30% are not uncommon for PCs after the first year on the market.

Compaq's pricing now ranges from \$6,099 to \$6,999 for 20-MHz models and \$7,999 to \$11,999 for the 25-MHz models.

Davis said there is evidence that Compaq has lost market share in some markets. "But then, Compaq doesn't manage for market share; it manages for revenue and profitable growth, and no one can complain about that [so far]," he said.

June figures compiled by Storeboard, Inc., a Dallas-based tracker of computer sales through the retail channel, revealed that IBM leads the 386 market, besting Compaq [CW, Aug. 28]. Storeboard President JoeAnn Stabel noted that IBM's 386 sales suffered in the first half of the year from an inability to meet customer demand for its 20- and 25-MHz models.

Available now, the Model 84 is priced at \$8,499. It features an 84M-byte fixed disk drive, 1M byte of random-access memory, a single 1.2M-byte diskette drive, six available expansion slots and a Compaq Enhanced Keyboard.

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Everyone's talking multimedia

Applications will teach PC end users more and faster, with audio and visuals

BY MICHAEL ALEXANDER
CNET STAFF

Multimedia, the mixing of sight, sound and software on a personal computer, shines like a light on train and the end of a long tunnel. You can see that the train is coming, but it is difficult to tell precisely when it will arrive or what it will look like when it does.

The idea behind multimedia applications is that audio and video can be used to enhance employee training and education in ways that are unmatched by more conventional means, allowing end users to interact with information rather than merely passively absorbing it.

The result is that end users learn more and learn faster, according to the technology's proponents. Some examples of work now under development are the following:

At Ogilvy & Mather Worldwide, market researchers are learning how to analyze consumer trends and buying motivations by using a combination of audio, video, animation and image processing on a PC. Truck drivers at De Post Co.'s safety service division are becoming better drivers by using a simulator that has been installed in a full-size truck cab block and that shows real highway scenes instead of computer graphics. Carnegie-Mellon University's Software Engineering Institute is using multimedia techniques to teach software code inspection, a highly labor-

search firms tracking the multimedia market, calculates that the worldwide sales of multimedia hardware and software will grow from \$440 million this year to \$1.1 billion in 1994.

That forecast includes sales of everything from 16-bit video game machines (only now coming to market) to consumer videotext information services but does not include applications that use what John Gale, president of the research firm, calls "PC cinema," or full-motion video. Desktop applications that include PC cinema are still too small a part of the market to calculate, although they will be pervasive.



come an integral part of multimedia in four or five years, he said.

Analysts predict that digital video interactive (DVI) and compact disc interactive (CDI), two competing standards for multimedia applications, will make the biggest splash in the multimedia market during the next few years. The two technologies are expected to succeed because they are backed by some of the top companies in the computers and consumer electronics industries.

DVI technology, which Intel Corp. acquired last year from General Electric Co., has won the backing of IBM and Microsoft Corp. CDI is being pushed by Philips Telecommunications N.V., Sony Corp. and Matsushita Electrical Industrial Co.

DVI technology involves compressing up to an hour of video as well as audio, graphics and other information onto a compact disc/read-only memory (CD-ROM) optical disc and decompressing it in a PC for playback. Without compression, a CD-ROM could hold only 30 seconds of digital video.

Boeing of Hill Intel and IBM propose to begin selling next year a DVI board to decompress video and other information stored on a CD-ROM for IBM's Personal System/2 computers and compatibles for about \$4,000.

There are some 20 companies working on DVI applications, nearly all of which are for employee training and education. Among the applications be-

ing developed are the following:
• Arthur Andersen & Co. is working on a system for its manufacturing consultants that enables them to capture factory processes on videotape, compress them onto CD-ROM and then analyze them on a PC in hope of finding ways to improve productivity.
• EDC International Corp. is developing a system for the military that will train personnel in identifying and tracking military targets with videos of actual terrain as backdrop.

DVI-based applications will be available in the early 1990s when Intel's chip sets and add-in boards are readily available for the end-user market, according to Jim Cannavino, president of IBM's Entry Systems Division.

CDI applications will be on the commercial market this year and on the consumer market next year, said Patrick Wilson, a spokesman for North American Philips Corp., the U.S. subsidiary of Philips Telecommunications N.V.
CDIs are virtually identical in appearance to digital audio CDs (co-developed by Philips N.V. and Sony) and can hold an hour's worth of digital audio, graphics and full-motion video as well as computer programs. Philips proposes to sell a CDI player (run-

ning a Motorola, Inc. 68000 microprocessor) for about \$3,000 to business users. The unit, which comes complete with a remote-control device and a joystick, plugs directly into a television set.

Learning tools

The initial applications will number about 25 titles for employee training and education, Wilson said. Developers of CDI programs include Rand McNally &

er and because of that has a significant advantage over CDI," Bose said. "There is an installed base of 50 million PCs, of which 75% are DOS-compatible, so there are 35 million in business and homes that can stand to benefit from it."

CDI, however, also has several advantages that could help to ensure its success, Bose said. It has the backing of Philips and Sony, "significant players in their own right," who are look-

The big picture

Three multimedia applications areas are projected to represent a \$10 billion market by 1994

MULTIMEDIA FORECAST	'88	'90	'91	'92	'93	'94
Information retrieval	\$100,000	\$4M	\$300M	\$720M	\$1.6B	\$3.4B
Business presentations	\$260M	\$300M	\$1.3B	\$2.2B	\$3.2B	\$4.4B
Education training	\$130M	\$300M	\$640M	\$1.4B	\$1.9B	\$2.5B

SOURCE: INFORMATION TECHNOLOGY GROUP

ON CHART: CREDITED LINES

Co., which is preparing an atlas that will include moving images of key tourist attractions, music and other information in addition to road maps. In addition, Grolier, Inc. is putting its encyclopedia on the interactive disc, complete with audio and video clips of historic events, inventions and news.

"DVI and CDI are niche market products right now," said Andy Bose, an analyst who follows the PC market for Link Research.

DVI is being positioned as a peripheral to a personal computer,

to promote CDI as an extension of CD audio and CD-ROM, technologies jointly developed by the backing of Philips and Sony.

Gale expects initially that DVI will make inroads into the business market, while CDI will move into the consumer market. Once entrenched, "DVI will move down and CDI will move up," he said.

"The installed base of PCs gives DVI an advantage in business, but there is also a lot of advantage to a stand-alone dedicated system like CDI that is also highly portable," Gale pointed out.

Covia and Loews offer key to hotel room access

BY ALAN J. RYAN
CNET STAFF

DALLAS — Travel agents may soon be able to make reservations electronically for their clients at independent hotels and small hotel chains. And travelers making their own arrangements may find they can make a reservation at a small hotel as easily as at a large chain.
Last week, travel distribution company Covia and Loews Hotels, a division of Loews Corp., announced they had signed a letter of intent to form Covia/Loews Automated Services (CLAS).

The service will offer to smaller hotels the systems, networking capabilities and larger reservation-center operations that a major chain might have, as well as representation in travel agency computer systems around the world.

"It is basically a sales and reservation computer for an independent

agent," said Paul Mercurio of Covia.

Hotels joining CLAS will have many options, Mercurio said. The most extensive implementation would involve installing in the hotel an IBM Token-Ring local-area network that would be connected to the local hotel computer system, he said. From there, a dedicated data line would be run from the LAN to the Covia Reserve system in Denver. "We would use that data line to communicate with the property, transfer reservation information and other management information back and forth," Mercurio said.

Covia Reserve is a network that enables travel agents to tie directly into the computerized reservation system of larger hotel chains. CLAS will work with Reserve in the same manner.

Additionally, CLAS is a marketing and sales service for smaller hotels. It will help with room sales that might not go

through travel agents.

"The difference [between CLAS and Covia Reserve] is the smaller chains may want to have the phone answered with their own name, such as, 'This is ABC Hotel Company, thank you for calling,' and not have the customers aware that they are not talking to an ABC employee," said Mercurio, the director of Covia Reserve. The Reserve system does not offer that feature.

The main operation for CLAS will be in Denver, and the system will be managed and operated by Covia, which also operates the Apollo computer reservation system.

The Loews contribution to the deal will be its hotel marketing experience, the support of the \$25 billion Loews Corp. and the reach of Loews Representation International, which provides more than 400 hotels with reservations, marketing and group sales services through 20 offices worldwide.

Travelers will not yet be able to book airline flights through the hotel using the CLAS or Reserve systems. But "that thought hasn't slipped our minds," Mercurio said.

"DVI IS BEING positioned as a peripheral to a personal computer and because of that has a significant advantage over CDI."

ANDY BOSE
LINK RESOURCES

intensive process requiring both programming and interpersonal skills.

There are as many permutations of multimedia as there are companies promulgating the concept. In its basic form, multimedia is the integration of text, graphics, audio and video images in applications designed to run on desktop computers.

Most applications now under development are stored on a 5-in. optical disc, although there are other storage technologies — digital audio tape, for example — under consideration.

The Information Workstation Group, one of the few market re-

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EDITORIAL

Survey says . . .

WHEN YOU COME right down to brass tacks, the prime criterion by which we measure our value at work is the size of our paycheck.

So what are you worth?

Is your salary keeping up with that of the Joneses at the company across the street? Across the state? Across the country?

How about those around you, those you manage? What do they think of their pay? Do they spend their days busy at work, helping to turn you into a corporate star, or are they surreptitiously dog-eared the recruitment advertising section of *Computerworld* in search of excellence in salary?

Today, beginning on page 1, we present our annual salary survey, which in the past has been received as a welcome wagon in some quarters and a crying towel in others.

The survey is, in fact, the most comprehensive such effort you will find anywhere. We logged more than 1,600 responses, the vast majority of which came from senior IS management. Then, we categorized the results according to 25 different IS titles across nine vertical industries and 14 major metropolitan areas.

Across most job titles, pay increases are keeping up with, if not slightly ahead of, the national average of raises for other professional occupations. However, there is a growing sense of unease within the lower ranks of the profession, which just a few years ago was graced with annual double-digit raises and abundant job opportunities.

There is aggressive growth, and hypergrowth in some instances, in compensation for those at the very top of the IS heap. And herein lie some of the more interesting paradoxes of the research.

While the rewards are growing the fastest for those in the top posts, so are the risks. As noted previously, life at the top is precarious, as evidenced in the past year or so by the abrupt exit of the IS directors of some of the biggest companies in the country.

More often than not, the postmortem of these departures revealed a sentiment within corporate management that IS was not providing the promised competitive edge that business is so desperately seeking. (The irony is that most corporate executives have little idea how to measure IS effectiveness, but that is another story. Perception is reality.) In a growing number of these turnover situations, the replacement is coming from a non-IS area, a trend we view as temporary and not particularly effective in the long term.

On the other hand, and to no one's surprise, the most highly and aggressively paid IS chiefs are those who have done the best job of selling the concept (the perception) of the information advantage to top management. It is also no surprise that these people also work for financially sound companies. That is, they share the credit as well as the blame, as they should.



LETTERS TO THE EDITOR

Have some respect

I am writing with regard to several totally tasteless comments made about Frederick Wang in the Inside Lines column (CW, Aug. 14).

While there is no doubt that Fred Wang will be a convenient scapegoat for Wang Laboratories, Inc.'s current problems, a strong dose of accuracy is in order. Fred assumed the helm of Wang at a difficult period in the company's history and has succeeded in navigating the company through very treacherous waters. Wang Laboratories' problems come at a time when the entire minicomputer industry is facing a severe downturn. His problems are not unique. They are just the tip of the iceberg.

Any executive in this business deserves more respect than the secondhand lampoons published in your column. It's easy to take a shot at someone when he is down.

Marty Gruhn
Vice-President
The Sierra Group, Inc.
Tempe, Ariz.

Brighter picture

Your article "Intecom future, Wang fortunes dark" (CW, July 31) contains some serious misinformation.

You stated that Intecom's selling price has dropped to \$60 million and predictions are it will have to be that down. This is not the case. The mentioned selling price is totally inaccurate, and Wang officials will confirm they have absolutely no intention of shutting down Intecom. I would also like to point out that Intecom is a cash-positive contributor to Wang and is not a financial drain.

I concede that Frank Dubeck's statement regarding overseas sales growth is totally correct. Intecom will soon announce a multiyear, multi-million-dollar agreement with a European partner. We are also rapidly developing a distribution strategy in the Pacific Rim.

In light of the slandering publicity, there are several good things I would like to share with you about Intecom:

- We're 10 years old!
- We're the No. 2 U.S. private branch exchange manufacturer.
- Intecom holds a 10% market share above 1,000 lines.
- Line shipments for the quarter ending June 30 were the highest in Intecom's history. Shipments for the first quarter of our new fiscal year will exceed last year's quarter.
- Intecom has concluded ISDN testing and received certification by AT&T. Additional field trials will begin in September.

We are well-positioned to meet and serve the needs of our clients for years to come.

Thomas R. Meyer
President and CEO
Intecom, Inc.
Allen, Texas

Key to the map

In "Mapinfo charts business course" (CW, July 17), there are some comments from users I would like to address.

First, Mapinfo combines the complexity of a computer-aided design package with Dbase. As such, to use its power fully requires training. This is why Mapping Information Systems Corp. sells Mapinfo through a network of value-added resellers, such as me.

I disagree with the comment that the user manual is "cryptic."

"Complex" would have been a better choice of words. It does include a detailed tutorial covering Mapinfo's functions that is a must for any beginner. Also, Mapinfo includes an on-line context-sensitive Help utility as well as Help browsing.

Several comments were made about the map-drawing process being slow. Actually, compared to CAD programs, I am amazed at how fast it is. A bottleneck can be created by the detail of the boundary, map, point and image files used and their number. This makes it a disk-intensive application. There are several solutions to speeding up the process. File caching utilities are one. Copying files to random-access memory (RAM) disks and operating off those is another. Last is investing in one of the hard-disk controllers now available that do their own caching.

The process of drawing itself can be improved in two ways. If your computer does not have the ability to swap video read-only memory into RAM built into it, and you have an Intel Corp. 80386-based personal computer, get a program such as Quarterdeck's QEMM-386 memory management program that includes a facility for doing so. Additionally, a math coprocessor will also help.

William P. Addis
President
Tender Data Systems
Case Junction, Colo.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Loberer, Editor, Computerworld, P.O. Box 9171, 375 Colchester Road, Framingham, Mass. 01701.

Telecommuting is here to stay

BY GIL GORDON



In the mid-1980s, you could not pick up a trade publication without seeing an article about telecommuting. Bold projections were made that led us to believe every programmer or systems engineer would be working at home in his pajamas.

When the office buildings, freeways and commuter trains didn't empty out by 1986, the skeptics had a field day. "See, we told you it would never catch on!" was the rallying cry of those who steadfastly believed office work could only be done in an office.

Guess what — telecommuting didn't go away, although it hasn't grown as fast and in the way that some of its futuristic proponents had hoped. Yes, telecommuting is alive and well, and it is positioned for steady, significant growth into the 1990s.

All the driving forces that were initially identified as the rationale for telecommuting are still there — in spades:

It's tough (and getting tougher) to find and keep good people.

It's tough (and getting tougher) to get to work, with gridlock spreading far beyond its Los Angeles and New York origins.

It's costly (and getting costlier) to put a roof over the heads of office workers, especially in light of growing pressure to cap operating costs in most industries as we move into the '90s.

It's important (and becoming

Gordon is publisher of "Telecommuting Review" and brother Gil Gordon Associates in Monmouth Junction, N.J.

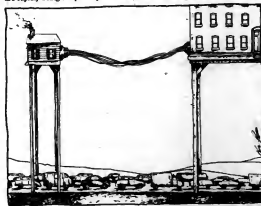
more so) to find ways to raise productivity of knowledge workers, especially because we're learning that throwing more PCs, more software and even the most advanced CASE tools at the problem is not the answer.

In addition to these forces, some new reasons for employer interest in telecommuting have become clear:

Abundant technology: The technological barriers that existed in the mid-1980s are rapidly being swept away as

have moved forward with pilot programs, and the firms that were the early innovators are now well into second or third rounds of expansion programs.

Work force pressures: Changing demographics of the work force and employee preferences (and often needs) for more flexible work arrangements are also driving forces. Savvy employers are willing to go beyond the five-day, 40-hour office-based work pattern that fits many, but no longer all, poten-



KEVIN FORT

tial employees.

Home sweet (distant) home: Employees and employers are increasingly caught in the real estate double bind. Employers want to hire within a nearby labor market, but many workers cannot afford housing close enough for a reasonable commute.

Just because telecommuting can and does work does not

mean it will catch on as initially predicted. Some companies just don't have the kinds of business problems for which telecommuting is a good solution, and some organizational cultures just don't support it.

However, I maintain that the close-supervision climate that is anathema to telecommuting is a managerial style that will soon collapse on its own. Today's employees will not put up with it, and it's a gross misuse of management time when most managers have too much to do and too little time to do it.

In this regard, some think that one of telecommuting's biggest benefits may be its potential undoing. In well-run programs, for a few days a week, people manage themselves at home quite well. The boss isn't (and shouldn't become) superfluous, and there just isn't as much need for direct access to the boss. Unfortunately, managers who feel threatened by successful telecommuting programs may try to block them.

Nonetheless, this happens to be one of the hidden benefits of telecommuting. In this age of downsizing and delaying,

the average middle manager is faced with an increased span of control. Typically, where two managers used to supervise three to five people each, their departments have now been combined and trimmed so one manager oversees six to eight people. Telecommuting is a great way to help that manager deal with being "stretched." If you don't have time to manage

everyone yourself, the solution is to allow some of the time to manage themselves part of the time.

But there's the rub. I have heard several top managers observe that if we allow people to manage themselves, why do we still need as many middle managers? This is not necessarily a good reason to implement telecommuting, but it is a good reason for inactive or short-sighted managers to resist, if not block it. If that happens, the company and the employees are denied the real benefits of telecommuting.

I predict a slow and steady growth in telecommuting for several reasons:

Management is more responsive to employees who need or want (and whose work quality merits) more flexibility in how, where and when they work.

Top management is more supportive as recruiting and retention problems continue to put the brakes on project schedules and as employers understand how well and how easily telecommuting can be tailored to fit different objectives.

More covert telecommuting will occur as employers who have their own PCs will occasionally work at home with the full support of their managers. These are the managers who realize that the return in higher productivity and employee satisfaction outweigh whatever risks exist in going against company policy.

There will be more realization that managers can have their cake and eat it too — they can have programmers or analysts who are user-oriented and well-managed and be productive at home for part of the week.

Telecommuting is one of those rare win-win solutions, and we will continue to see it grow if we don't put artificial roadblocks in its path.

Setting the 'perfect' yearly performance plan

BY MICHAEL B. COHN



When I was a programmer, life was pretty simple: Produce a lot of code, don't produce a lot of bugs.

When I did it right, I got nice raises, and when I didn't do it right, they moved me into a more harmless, management position.

Being a manager was more complicated. The vice-president set up a confusing annual performance plan, with impossible

phrases such as "Ensure minimal turnover." "Aggressively meet all deadlines." and "Be all things to all people." When I did these things, the vice-president announced a 15% across-the-board raise. No one told me that the raise was for the board of directors.

The bottom line is that a high-tech manager's performance plan is pretty unrealistic. If anyone could achieve half of their corporate goals in a one-year period, they probably would have gone to medical school in the first place.

What I would like to see is a more appropriate performance plan — one with phrases such as "Fool some of the people some

of the time," and so forth. What I propose is a manager's yearly performance plan that looks something like this:

- **Resolve IS issues.** Promptly address user problems. Quickly investigate possible errors. Immediately blame your predecessor.
- **Maintain production systems.** Provide consistent support for all systems and ensure that systems crash only when nobody is looking.
- **Improve corporate visibility.** There are a lot of executives in the company who still do not know who we are! This year, make sure there are twice as many.
- **Exercise good judgment.** Three out of five major IS projects were canceled last year. This year, make sure nobody finds out if we cancel the other two.
- **Achieve project milestones.** "Go live" with the New

Billing System by April 30. Realize that it's a ditch by June 30. Find the right ditch by Sept. 30. Say "I told you so" by Nov. 30.

- **Manage operations resources.** Decrease downtime, increase uptime or vice versa.
- **Improve morale.** Ensure that your people have adequate supplies. Sponsor company social events.
- **Constant costs.** Keep the annual budget for supplies and social events under \$25.
- **Implement PC plan.** Send staff to an introductory personal computer class by March. Place orders for PCs by April. Wonder what happened to your order by November. Resend staff to an introductory PC class in December.
- **Eliminate all consultants.** Reduce budget by terminating all contract technical writers, contract programmers and contract database designers.

• **Enroll yourself in continuing education.** Possibly focus on classes in technical writing, programming and database design.

• **Improve efficiency.** Figure out ways of working smarter, not harder. But in the meantime, it would be smarter if you worked harder.

• **Demonstrate planning abilities.** Be prepared for all contingencies by evaluating each assignment. Devise a measurable plan, an achievable completion date and a believable excuse.

• **Recognize your top performance.** Maybe even learn a few of the names.

• **Take all deferred vacation.** Preferably on Saturdays and Sundays.

• **Build your career plan.** Where do you see yourself in a two-year time frame? In a 10-year time frame? Commit to achieving your two-year plan ... in a 10-year time frame.

Change is the enemy of procedural programming. Altering one aspect of a program can take weeks. And while you redesign, recompile and retest, you spend huge sums of money, and sacrifice irretrievable market opportunities.

Unfortunately, change is inevitable, and survival depends on your ability to adapt. That's not just a cruel law of nature. It's a hard fact of business.

It's time that programming, too, embraced change.

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By its very nature, the world embraces change.
By its very nature, conventional programming does not.

SYSTEMS & SOFTWARE

HARD TALK

Rosemary Hamilton

IBM gets its bearings



It has taken a long time, but it looks like IBM finally has a good grip on the bearing problem that hit its 3380

J and K drives.

It went after the problem on several different levels, now, nearly two years after the drives were introduced, things appear to be wrapped up.

What's interesting, however, is that an IBM spokeswoman said recently that the problem wasn't widespread. If that's the case, then what we have here is an IBM reaction comparable to extinguishing a cigarette with a fire hose.

IBM has worked extensively with 3380 customers, apparently as far back as spring 1988. In many cases, it has replaced the entire head disk assembly unit to correct the drive prob-

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Inside

- Standard adds new development tool. Page 25.
- IS execs open their minds to open systems. Page 25.
- Emulex tries to outdo DEC with storage products. Page 28.

Reality checks in at AI show

Signs of mainstream acceptance and vendor support proliferate

BY STANLEY GIBSON
STAFF WRITER

DETROIT — As long as it has existed, artificial intelligence has been struggling to find its place in the "real" world.

Finally, there are signs that it is succeeding. AI modules are increasingly finding their way into mainstream applications. Vendors and users alike have come to recognize that the stand-alone AI application is growing more and more rare.

"The AI market is at last becoming real," said Les Hellenack, an analyst at International Data Corp. (IDC) in Framingham, Mass. While still a relatively small corner of the computing universe, the AI software market grew from \$85 million in 1987 to \$150 million in 1988, according to figures from a soon-

to be released IDC study.

Some vendors are banking on the increasing acceptance of Unix and AT&T's C++ and object-oriented programming language to accelerate AI's penetration of corporate information systems departments.

At the recent International Joint Conference on Artificial Intelligence, several vendors stressed Unix and C++ strategies. The conference hosted 6,000 attendees who heard the customary academic papers read. But this year's gathering continued a trend toward greater vendor participation, which may reflect wider acceptance of their products.

Texas Instruments, Inc. announced an agreement with Saber Software, Inc. in Cambridge, Mass., under which Saber will help TI create a C and C++ en-

vironment that will be integrated with TI's Standard LISP Environment (SLE), according to Peter van Cuylenburg, vice-president of TI's data systems group.

TI also introduced Release 6.0 of its Explorer and Micro Explorer system software, which include SLE.

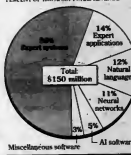
According to van Cuylenburg, adding C and C++ to SLE will allow corporate users to take a shell written in LISP and add C and C++ modules via

The C++ code will compile to C and therefore be readily maintainable by C programmers, who tend to be more plentiful than programmers well-versed in

Experts lead the way

More than half of the \$150 million in revenue that U.S. vendors collected from artificial intelligence software in 1988 was related to expert systems:

PERCENT OF 1988 AI SOFTWARE REVENUE



SOURCE: INTERNATIONAL JOINT CONFERENCE ON ARTIFICIAL INTELLIGENCE

LISP, van Cuylenburg said.

Also part of the planned environment will be the so-called "Zeigist project," in which an

Continued on page 26

Mellon on EIS: Execs sink teeth into system

ON SITE

BY AMY CORTESE
STAFF WRITER

PITTSBURGH — Anthony Terracino has the big picture at his fingertips; the president of a major bank has to.

Not long ago, that meant that many reports and much paper-work prepared by the bank's dif-

ferent divisions and sent to the chairman's office be combined and reviewed.

But Terracino, president and chief operating officer at Mellon National Bank, now uses an executive information system (EIS) to merge pieces of information from Mellon's diverse operating divisions and assemble a clear picture of overall — or individual — performance within

the company.

Terracino himself was the driving force behind the development of the EIS — a decision-support system geared toward high-level executives. Now the chief information officer uses it,

 **Mellon Bank**

and other executives in the office of the chairman will soon follow.

Mellon's Information Management and Research (IMR) division started the project last October. Using Pilot Executive Software's Command Center and Advantage/G application

generator, the bank holding company had an EIS up and running by early February, according to James Stuber, vice-president of corporate information and technology at Mellon.

The project was initiated in large part, to consolidate information from Mellon's various divisions onto a common platform. Mellon Bank is made up of seven retail banks, including one based at the Pittsburgh headquarters. Some branches are large enough to have their own computer operations, but much of the processing is done at the headquarters data center, which acts as a

Continued on page 27

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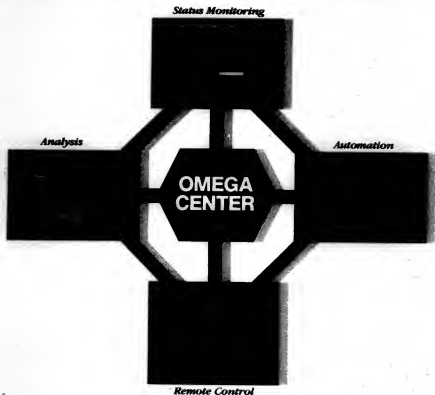


FISCHER
INTERNATIONAL
STAFF WRITER



ELECTRONIC MAIL COMMUNICATION CENTER / TOTALLY AUTOMATIC OFFICE

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 - 20 Systems or Peripherals
 - 21 Computer & Software, including Software/Service
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 - 19 Other Computer Management
 - 20 President/General Manager/General Mgr.
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 - 12 Medical/Life/Education
 - 13 Professional/Service/Trade
 - 14 Business Service (except gov't)
 - 15 Business Service (except retail)
 - 16 Communication (except Public Utilities)
 - 17 Transportation
 - 18 Manufacturing/Construction/Processing/Wholesale
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City turns to DBMS, 4GL to keep pace

ON SITE

BY RICHARD PASTORE
OF STAFF

STAMFORD, Conn. — The city of Stamford's information systems department has for years been battling hiring freezes and corporate competition for scarce workers while trying to meet an onslaught of demand for more services.

With reinforcements hard to come by, the small IS force has opted to increase its firepower with a new development weapon — the Datacom/DB relational database management system and CA-ideal fourth-generation language from Computer Associates International, Inc.

Data processing manager Robert Thomas, who has been with the department 14 years, has seen applications go from batch to exclusively on-line, an IBM 4381 Group 13 host replace an IBM 4341 mainframe and 120 terminals and PCs overtake the department's original single terminal. Yet, the staff has only grown by four people in that time — to 15 workers — while demand for applications has tripled.

"There have been many years that there were freezes on hiring, and it hurt," Thomas said. "We have a small department for this size city. Bridgeport and New Haven have two to three times what we have here."

The department is responsible for 1,500 government and

department of education users in this city of 107,000.

Though the freeze has been lifted in the last two years, the corporate boom that took place in Stamford in the early 1980s has hampered hiring for several reasons. With GTE Corp., Xerox Corp., Mobil Corp.'s Mobil Chemical division and a host of other big corporations located down the street, Thomas faces steep competition for staff members.

Thomas said.

So, the department has turned to work-saving systems and strategies like the one involving CA. After the city board of directors voted buying a commercial purchase-order package because it was too expensive, the department won approval for the CA system. "This may cost the same amount spread over time, but it won't be just for one application; it will be for all our development. That's a different story," Thomas said.

In July, the department began deploying the bundled system, which is now up and running on its 4381 under DOS/VSE. In addition to the 4GL and DBMS, it includes CA query and report generator tools.

The CA system is the department's first stab at an RDBMS; it had been using indexed files. Thomas also considered IBM products — including Cross System Product and SQL/DS — but CA won out because the company made the cost more palatable by agreeing to spread payments out over five years.

Thomas said he is counting on more productivity using the new system for development. "Now we write in Cobol command level; it is much more wordy and we have to do a lot more testing than we will under this [CA] system," he said.

Use of the CA system will result in a fivefold improvement in productivity, Thomas estimated. "We could save even more, de-

pending on the amount of maintenance we do," he added. "Now, if we add a new field of data to a database that has 20 programs running against it, then they all have to be changed. That will not happen with the relational database; you can add new fields and your programs will still run."

The first application the department will attempt under the system will be a rewrite of the 8-year-old voter registration pro-

gram. "It will be a learning experience for us; they will have a person looking over our shoulders while we try it," Thomas said. With this test application and some as-needed CA training under its belt, the department will be ready to tackle a complex purchase-order system that the board of education administration has requested, he said.

CA-ideal offers the option to update old Cobol applications without completely rewriting them — a key capability, because the IS department runs about 20 major homegrown applications that are in Cobol.



Stamford's Thomas has seen demands on IS triple

Open systems draw an upscale audience

ANALYSIS

BY AMY CORTESE
OF STAFF

The concept of open systems has finally captured the imaginations of corporate information systems managers. At least that was the way it appeared at the recent Uniform trade show in Boston, where suit-and-tie clad executives from commercial corporations were sighted in increasing numbers amid the traditional ponytailed attendants.

Looking to reap the benefits of open systems, the IS managers were there typically to learn more about Unix.

Bruce Menozzi, a senior systems specialist with Du Pont Co.'s Fiber Department in Charlotte, N.C., said his firm's interest in Unix was driven by two reasons: the attractiveness of reduced instruction set computing (RISC) platforms and open systems based on standards. While he said Du Pont is approaching Unix cautiously, the corporation

is committed to exploring it.

Similarly, another commercial user, Tom Hampton, technology developer at Lisle & Co., Inc., did not hesitate to say why his firm finds Unix compelling. "Everyone is going in that direction; it's the only strong future wave," he declared. Hampton also said he is attracted to the networking capabilities of Unix, and wants to avoid being locked in to a particular vendor.

Lisle & Co., a Lyme, N.H.-based financial processing firm, presently uses a Stratus Computer, Inc. system to perform payment processing for its clients. However, Hampton said, it is transaction processing at a premium price. "If you can do transaction processing on a small but serious computer, why not?" Hampton asked. He views the increasing power and declining cost of Unix workstations as an attractive alternative.

Vendors at the show, meanwhile, were trying to shed the image of molots fighting over

Continued on page 28

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AI show

FROM PAGE 23

SQL relational database management system will be combined with an object-oriented DBMS. The environment will be optimized for Unix, which van Cuylenberg said he is confident will become accepted in the largest IS shops.

Also, Sun Microsystems, Inc. announced Sun C++, which is based on AT&T's recently released C++ Release 2.0. Sun integrated some of its existing programming tools in the language, which is slated to be available in October.

"The LISP market is shrinking in favor of C++," said Harvey Newquist, editor of "AI Trends" in Scottsdale, Ariz.

"With LISP you have to learn all of LISP. But with C++, you have only to learn extensions to C," he added.

However, IDC's Hellenack differed. "Some people should program in C++, but not a lot of them. Nothing is going to happen in this market unless it's in MVS and addresses enterprise-wide computing." To do that, he said, it will be necessary to inte-

grate AI modules with existing applications.

Seeking to penetrate corporate accounts by this method, Neuron Data, Inc. in Palo Alto, Calif., announced a version of its Nexpert Object expert system shell for IBM's MVS and VM operating systems. Neuron Data said Nexpert Object can run on IBM MVS or VM hosts connected to terminals or cooperatively

processing workstations. The MVS version is offered with an optional DB2 bridge; the VM version has an SQL/DS bridge option. The vendor claimed the products will be available in the fourth quarter and will be compatible with IBM's Systems Application Architecture.

Neuron Data also announced the OS/2 Presentation Manager development version of Nexpert Object, available immediately. The runtime version had been announced previously. First developed for the Apple Computer, Inc. Macintosh, Nexpert Object was subsequently ported to Unix, VMS, MS-DOS and OS/2.

Looking at languages

Digital Equipment Corp. is still "evaluating C++ and other languages," according to Jack Rahaim, DEC's manager of corporate artificial intelligence marketing. However, DEC made several AI announcements. DEC said it will resell Epitool, an object-oriented tool implemented in VAX LISP. Epitool was originated in Sweden by Epitex AB. DEC also added a computer network security facility called ISAFE — which had been used by DEC for two years on its own networks — to its security consulting services for VMS environments.

Rahaim also said DEC is working to bring LISP to its Ultrix version of Unix. He continued to express DEC's position of strong support for both VMS and Unix, but said that identical AI and object-oriented products sets would not necessarily be announced for both. DEC's Ultrix environment will cater to a more technical community of users, while VMS will address a more commercial market, Rahaim said.

In other announcements at the show, vendors continued to lend momentum to the trend to downsize AI development platforms. AI Corp., Inc. in Waltham, Mass., unveiled a version of its Knowledge Base Management System, KBMS/PC, for MS-DOS-based personal computers using an MS-DOS virtual memory facility. AI Corp. also announced runtime versions of KBMS for OS/2 and MS-DOS as well as MVS and VM. Intellicorp, Inc. in Mountain View, Calif., announced Configurable-KEE, which is intended to deliver applications at a low cost. The product is now shipping for Sun Microsystems, Inc. workstations running SunOS 4.0.

Both Newquist and Hellenack suggested that the need exists for a "Cobol++," which, like C++, would be an object-oriented extension of a widely used language. Such a language could draw on the very large number of skilled Cobol programmers and allow them to move to an object-oriented environment with a minimum of retraining, both analysts said.

Systems software for MVS data centers:

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408 645 300

COMPUTER
ASSOCIATES

Hamilton

CONTINUED FROM PAGE 23

lem. The problem stems from a bearing in the head disk assembly unit that causes internal vibration, which, in turn, can cause error messages and performance degradation.

A year ago, IBM changed the bearing used in J and K drive production so that all drives made after that time would not be afflicted with this internal vibration problem.

Then, in early 1989, it began shipping an early warning system, which is made up of microcode for the disk drive controller that would alert users to potential bearing problems.

Finally, IBM just recently made generally available an engineering change that would replace the older bearing.

All this for a relatively small problem? Yes, says IBM.

Why would the organization go so far as to make an engineering change generally available if it had already taken the other earlier steps? According to IBM,

Mellon

CONTINUED FROM PAGE 23

service center. By one account, there are 23 different transaction processing systems in use.

The EIS brings together data that has been stored in various places. The IS staff maintains the database, uploading files received from various sources and divisions on a monthly basis.

Data resides on a Digital Equipment Corp. VAX, while all the presentation and manipulation is done on an IBM Personal System/2 running MS-DOS. The Pilot software product, along with DEC PC services and Ethernet, enables the application to share data between the VAX and PS/2 cooperatively, explained Meru Thakur, manager of the High Technology section of IMR.

"The success of an EIS depends on the ability to quickly prototype and have something to demonstrate," Thakur noted.

In addition to quick results, EISs are designed for ease of use. Mellon's EIS is intuitive, Thakur said, and is "designed for a person not using a manual or command language." Graphic capabilities transform his toric data into images that convey trends at a glance.

The time it takes to train executives on the system varies depending on how comfortable they are with a PC, but usually is a matter of hours.

Mouse-driven system

The system is mouse-driven and allows for analysis at varying levels of detail. When the cursor is put on a piece of text and clicked, another level of detail comes up.

For instance, an income statement consolidating all lines of business can be viewed. Numbers falling outside of accepted variances are flagged by a predefined color code. The executive can then get more detail or a graphic representation of that particular line of business by clicking on the number with the mouse.

In addition to aiding decision making, the system can allow executives to use the tool to share information on the bank's position, Thakur said.

that's just policy.

Further, the company stressed that it is totally up to the customer to decide whether he wants to install this engineering change or not. As is very often the case with IBM, it is once again a matter of word games. The organization avoids at all costs calling a problem a problem and by doing so appears to be hiding something.

The bottom line is that the disk-drive problem itself isn't necessarily putting egg on IBM's face. However, the way the company discusses its "problems" is.

Ironically, users contacted recently said they were pleased with the way IBM has handled the situation and have found that once IBM fixed the drive, they had no further problems.

IRONICALLY, USERS contacted recently said they were pleased with the way IBM has handled the situation and have found that once IBM fixed the drive, they had no further problems.

Obviously, they would have preferred not to have had any problems at all. But under the circumstances, things turned out as well as they could for these particular users.

One user, for instance, said IBM's early warning microcode has worked very well. By alerting him to potential problems, the microcode allows him to schedule what he calls a "soft downtime," meaning he can set up the repair job at a convenient time.

Without the microcode, he would have found out about the faulty bearing by getting errors on the system.

Ton bad IBM can't directly acknowledge the situation for what it is and let the users speak up. The users, in this case anyway, ended up making IBM look good while the company did itself some damage.

Hamilton is Computerworld's senior editor, systems.

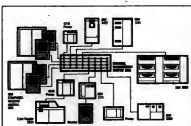
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8 x 16 matrix on one 2-foot floor tile	YES	NO	NO
Easy online expansion and maintenance	YES	NO	NO
PC-based control system	YES <small>optional</small>	YES <small>optional</small>	NO

While other channel management systems race neck-and-neck toward obsolescence, Dynatech's CMS 3900 STARPLEX sprints toward the future.

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Emulex adds to VAX storage

Unveils disk arrays, low-priced, powerful data channel card

BY MARYFRAN JOHNSON
CRITIC

COSTA MESA, Calif. — Emulex Corp. recently boosted its line of storage products for the Digital Equipment Corp. VAX market with a series of disk arrays and a data channel card that Emulex claimed is less expensive and more powerful than DEC's offering.

At \$6,500, the Emulex DA01 data channel card is about half the price of DEC's HSC5X-BA card, which sells for \$11,710. The DA01 card will ship this month, company officials said.

Endrex, a major third-party supplier of subsystems in the DEC storage market, unveiled three storage subsystems called Standard Disk Arrays and a terminal server targeting the Unix market.

DEC defends storage rights

Although company spokesmen dismissed the notion of a patent-infringement lawsuit from DEC, the Maynard, Mass., mini-computer company has aggressively defended its legal rights in storage technology in the past.

"DEC just doesn't want third parties coming in and attaching stuff to their computers. They make a lot of money on disk drives," said Bob Kitzire, vice-president of Disk Trend, a market research firm in Mountain View, Calif., that follows the disk drive industry.

The DA01, a microprocessor-based data channel card, can interface up to four disk drives. Entelox officials said the channel card supports higher data transfer

Don Reese, manager of marketing and communication for Emulex, said talk of a patent-infringement lawsuit by DEC was "just sensationalism."

The Emulex Standard Disk Arrays, offered in three configurations priced from \$11,644 to \$226,396, provide faster data access time and require one-fourth the space of the competitors', said Joe Traficante, Emulex marketing manager for DEC-compatible products.

NEW DEALS

Unisys inks \$4.5M deal with insurer

Employers' Mutual Casualty Insurance Co. in Des Moines, Iowa, put in a \$4.5 million order to **Unisys Corp.** for a package that includes a 2200/600 mainframe, peripheral equipment and professional services. Peripherals include 9494 disk storage devices and a DCP 50 Communications Processor. **Employers' Mutual** has been using **Unisys** 1100 mainframes.

Convex Computer Corp. sold a C240 minisupercomputer to the Research Institute of the Scripps Clinic in La Jolla, Calif. This nonprofit group will be using the Convex system to examine structures

EECO Computer Inc. recently sold \$1 million worth of property management systems to three hotel groups, including the Sheraton Washington Hotel, Helmsley Hotels in New York and the Walter Co.'s Hilton Hotel in Palm Springs, Calif.

The ISDN

Showcasing ISDN applications

BY JEAN S. GOODMAN
CIVIL STAFF

SCOTTSDALE, Ariz. — AT&T last week drew major support for its quest for MDS and support for ISDN technology.

After years of preparation, AT&T is now able to showcase its Digital Network (ISDN) equipment from such vendors as Tandem Computers, Equipment Corp. and Wang.

ISD
CO

An ISDN Opportunity

AT&T, others offer wide range of ISDN products at low prices

SEATTLE

Open systems

CONTINUED FROM PAGE 25

their particular version of Unix and stressed pushing standards beyond Unix. Alex Morrow, vice-president of strategy at the Open Software Foundation (OSF), said that openness is not a function of operating system software.

Rather, "an open environment will be one that employs a standard set of interfaces for programming, communications, networking, systems management and user look and feel." Lawrence Dooling, president of AT&T's Unix Software Operation, conceded that Unix will share market growth with OS/2, and that the two operating systems will have to coex-

Software dominated the exhibition hall with OSP's Motif graphical user interface as a recurring theme being demonstrated at a number of booths. Apple Computer, Inc. was also in the spotlight.

Several vendors announced software packages for A/UX, which recently won Apple Computer, Inc.'s major U.S. Air Force contract.

British software vendor Uniplex announced Uniplex Windows, an X Window System-based desktop management system slated to be available in October. The system will support multiple graphical interfaces, but the company said it will provide an OSF/Motif look and feel.

Unify Corp. unveiled versions of its Accell application development system and the Unify relational database engine for A/UX.

**ISDN applications
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ISDN STEALS SPOTLIGHT AT ICA SHOW

thousand people and more than 300 exhibitors expected at the Dallas extravaganza April 30-May 1.

CA ISDN Demo: Ne

EDITORIAL

AT&T To Let Telcos Users Free ISDN

Offer

AT&T confirms, expands ISDN

AT&T To Spotlight 11 ISDN

NEW PRODUCTS — SYSTEMS

Turnkey systems

General Automation, Inc. has introduced a modular series of Motorola, Inc. 68020-based business computers that enables the user to tailor a system to his own specifications.

The GA3000 series reportedly offers options in terminal connectivity (8 to 64), processor speed (12.5 MHz to 64 MHz), memory (1M to 8M bytes), disk capacity (up to 4 with individual capacities ranging from 74M bytes to 517M bytes formatted), and type of magnetic media backup. According to the company, the

series also offers uninterruptible battery backup power supply, various data communications facilities and the company's local-area network.

Based on options selected, the systems range from \$14,990 to \$140,000 in end-user pricing.

General Automation
P.O. Box 48483
1055 South East St.
Anaheim, Calif. 92803
714-778-4800

Processors

Wang Laboratories, Inc. has introduced

CS/386, an addition to its CS computer line that is based on an Intel Corp. 386 microprocessor.

According to the vendor, the 32-bit multitasker CS/386 delivers twice the power of the earlier CS models. The product reportedly comes in four models that are compatible with earlier 286, MicroVp and CS peripherals, communications controllers, and option boards and software. The CS/386 can support up to 16 users as well as read and write MS-DOS files, the vendor said.

Its price ranges from \$7,500 to \$12,500.

Wang Laboratories
One Industrial Ave.
Lowell, Mass. 01851
508-459-5000

Applied Digital Data Systems, Inc. (ADDS) has announced an expansion kit that reportedly will allow the organization's 16-bit, 10-MHz Intel Corp. 80286-based Mentor 1700A entry-level business computer system to be upgraded to a 32-bit, 16-MHz Intel 80386-based Mentor 1800.

The M1800 Upgrade Kit's migration is said to increase processor performance and to expand top-end connectivity from 11 to 17 users. According to ADDS, both models use the Pich Systems, Inc. Pich Operating System, and are compatible with the larger ADDS Mentor 6000 series based on the NCR Corp. Tower platform.

The price is \$3,900.

ADDS
100 Marcus Blvd.
Hauppauge, N.Y. 11788
516-231-5400

I/O devices

Ander Corp. has added to its family of bar-code input devices, announcing the BCD-300 Bar Code Decoder.

The external device is said to allow bar-code data to be entered through an RS-232 port or a dumb terminal. The product utilizes a wand-type scanner or laser gun and will reportedly auto-recognize 11 common bar-code symbologies, including UPC, UPC-E and Code 39. The BCD-300 can also be used as a portable collection device and is priced at \$595.

Ander
1070 Ortega Way
Placentia, Calif. 92670
714-632-7000

Byten Corp. has introduced a line of channel switches that can be used to allow mainframes to share peripherals and reconfigure peripheral equipment to alternate mainframes during a system failure. The channel switches complement Byten's matrix switches and can be configured in Matrix sizes ranging from four by two channels to 32 by 48 channels. They also can be interconnected to form larger systems.

Prices range from \$30,000 to more than \$500,000, with product availability 45 to 60 days after receipt of order.

Byten
Southshore Office Park
120 Turnpike Road
Southshore, Mass. 01772-1886
508-480-0440

Power supplies

Superior Electric Co. has introduced portable power conditioners that maintain proper voltage to computers and other sensitive equipment.

The PFC Series Stabilize Power Conditions reportedly maintain output voltage at 120 volts, plus or minus 5%, and provide 120-dB typical common-mode noise rejection and 60-dB typical transverse-mode noise attenuation. The conditioners have an energy storage capability that permits a ride-through reserve during fractional power outages, protecting the load for loss of input for up to 3 milliseconds. They are said to be designed for plug-in connection and feature a carrying lip on the cabinet top.

The price ranges from \$145 to \$295.
Superior Electric
383 Middle St.
Bristol, Conn. 06010
203-682-9561

Scorecard

(Part 2)

Who's really putting ISDN on the map? If you've seen the headlines, you know the score.

You only have to scan the trade press to see who's the clear-cut ISDN leader. The company that helped build the standards for ISDN. The company that's helping local telephone companies turn the promise of ISDN into Real-World Solutions. The company: AT&T.

95% of ISDN lines are on an AT&T SESS[®] switch

AT&T Network Systems has helped more local telephone companies install more ISDN lines than any other telecommunications supplier—some 95% of non-trial ISDN lines. What's more, we're already shipped over 260,000 ISDN lines for future use.

Today, 162 central offices can offer operational ISDN services from the AT&T SESS switch—with 618 upgraded with ISDN software. Combined, these central offices have the potential to offer ISDN services to 15.5 million telephone company customers.

So, while most other suppliers are still in product development trials,

AT&T Network Systems is helping phone companies across the nation offer Real-World ISDN services right now. Services such as simultaneous voice and data transmission, high-speed facsimile and electronic mail—all over a single phone line. Services that utilize your existing telephone network to dramatically increase productivity and efficiency for businesses, from hospitals and insurance companies to investment, publishing and law firms.

ISDN is just the beginning

We believe that ISDN is the beginning of an even bigger future. A future we call Universal Information Services. A future where networks will be able to meet complex communications needs for voice, data and image—simply and economically.

At AT&T Network Systems, this belief is already driving our technology, our product development, and our commitment to you.

AT&T Network Systems is a participant in the Communications Consortium.
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AT&T
The right choice.

NEW PRODUCTS — SOFTWARE

Applications packages

Index Technology Corp. has introduced XL/Doc, a document generator that automatically creates formatted documents that meet a variety of government and business standards.

The program reportedly creates documents that meet the Department of Defense 2167A standard for software development contractors. According to the company, features include boilerplate text insertion, automatic paragraph numbering, table of contents generation, external file inclusion and automatic table creation. XL/Doc can be customized to meet other government standards such as NASA, FAA and the U.S. Army's 7935A documentation standard.

The program has been designed for use with the company's Executor/RTS real-time systems analysis and design product. The price is \$7,900. Index Technology
One Main St.
Cambridge, Mass. 02142
617-494-8200

Technetronic, Inc. has released Version 1.2 of Graphic Gateway, its statistical data analysis package.

The package was designed for users of SAS Institute, Inc. databases residing on IBM or plug-compatible mainframes. The product reportedly allows any user, via an IBM Personal Computer AT or Personal System/2 connected to the host under TSO, to select variables from any SAS da-

tabase on the mainframe for downloading and examination.

Graphic Gateway 1.2 is priced from \$6,000, including two copies of the workstation software.

Technetronic
400-7927 Jones Branch Drive
McLean, Va. 22102
800-367-3550

System software

Intel Corp. has upgraded two real-time microcomputer operating systems.

Release 8 of iRMK I, a 16-bit operating system that runs in the real-address mode of the Intel 8086 through 80386 microprocessors, reportedly has increased speed in certain interrupt communications and a round-robin scheduler that is useful for multitask developer systems.

Release 4 of iRMK II is said to feature increased support of the company's Multibus II architecture and has the ability to send messages between tasks running on the same CPU board.

A single development copy of iRMK I.8 costs \$5,000, and the I.4 operating system costs \$5,500. Intel
Literature Dept. AP-48
P.O. Box 58065
Santa Clara, Calif. 95052-8065
800-548-4725

Development tools

Abraxis Software, Inc. has announced

Codecheck, a software development tool for C programmers.

The tool reportedly analyzes code for portability, maintainability and style. The company stated that Codecheck is designed to target code for compatibility among PC-DOS, OS/2, Unix, VMS and Apple Computer, Inc. Macintosh environments. The product is said to support all C compilers from major vendors and requires 512K bytes of memory.

The price is \$295. Quantity discounts and site licenses are available.

Abraxis Software
7033 S.W. Macadam Ave.
Portland, Ore. 97219
503-244-5253

Treehouse Software, Inc. has announced N/O, a change management system that reportedly controls the migration of Natural language programs between test and production libraries in a Software AG of North America, Inc. Adabas environment.

According to the company, the software features automatic archiving, electronic authorization, audit trails, local and remote node movement and on-line and batch execution.

For all operating systems, the price of the N/O software is \$20,000. Treehouse Software
Suite 206
400 Broad St.
Sewickley, Pa. 15143
412-741-1677

Data General Corp. and Oasys, Inc. have announced that Oasys development tools are available for the Data General Avision and Dasher/386 product families.

The tools reportedly allow programmers to use the Data General systems as development platforms for Intel Corp. and Motorola, Inc. microprocessors. The tool kit consists of optimizing compilers, a macro assembler/linker, a librarian, a multi-window debugger and a simulator. These features enable users to create, test and simulate applications on the Data General systems and download them into Motorola- and Intel-based environments.

Prices start at \$2,000.

Data General
3400 Computer Drive
Westboro, Mass. 01580
508-898-4051

Artificial intelligence

Carnegie Group, Inc. has expanded its Knowledge Craft product line with the announcement of the Rapid Prototyping Methodology (RPM) and the SQL Database Connection.

According to the company, RPM provides an easy-to-use, fill-in-the-blanks approach to building a knowledge-based system prototype. It runs on a variety of platforms, including Intel Corp. 80386-based systems, Digital Equipment Corp. Microvax II and III and Sun Microsystems, Inc. workstations. Pricing ranges from \$2,000 to \$4,000, depending on configuration.

The SQL Database Connection was reportedly designed to integrate knowledge-based applications with Oracle Corp.'s Oracle databases. The package is currently available on all DEC VAX platforms and is priced beginning at \$4,000. Carnegie Group
Five PPG Place
Pittsburgh, Pa. 15222
412-642-6900

Computing, U.S.A., Inc. has released Version 9.0 of MetabolExpert, reported to be an artificial intelligence-based expert system developed for metabolic predictions.

The latest version includes species selectivity with 35 choices and an expanded knowledge base with heuristic capability for incorporating the user's own metabolic intelligence into the program, the vendor said. The software runs in both IBM Personal Computer and Digital Equipment Corp. VAX environments and is priced from \$8,900. Computug, U.S.A.
P.O. Box 202078
Austin, Texas 78720
512-313-0880

Computer-aided software engineering

Cadre Technologies, Inc. has introduced Pathmap, a run-time reverse-engineering tool for embedded systems software.

The product reportedly graphs software behavior, monitors real-time embedded software as it executes and produces design-level documentation of the software's behavior. According to the company, the program can be integrated into Cadre's Testwork workstation computer-aided software engineering capabilities. Pathmap can run on an IBM Personal Computer, AT or compatible, the vendor said.

Prices start at \$27,000 for complete systems. For Cadre Testwork or Software Analysis Workstation owners, the price is \$6,950.

Cadre Technologies
19545 N. W. Von Neumann Drive
Beaverton, Ore. 97075
503-690-1300

Nastar Corp. has released an enhanced version of Rtrace, the company's requirements management and traceability software environment for Digital Equipment Corp. VAX/VMS systems.

According to the vendor, Version 1.1 includes improved screen design and shortcuts for repetitive functions, as well as several additional reports to provide systems engineers with supplemental project information. The product reportedly runs on VMS 4.6 or higher versions with a minimum of 60,000 free blocks and 4M bytes of memory.

The single-copy price is \$30,000.

Nastar
24681 Northeastern Highway
Southfield, Mich. 48075
313-355-3300

Utilities

Sylog Corp. has announced Csort 1.5, a sort utility that has been designed to allow on-line and real-time sorting in CICS applications.

According to the vendor, the latest version can support the use of the Cobol sort verb under CICS in VS/COBOL II applications in MVS and MVS/ESA environments. The utility also can support VS Cobol applications under VSE, the company said.

The product is available on a per-minute license basis for \$14,000 for the MVS and MVS/ESA versions and \$7,000 for VSE.

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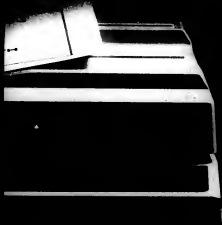


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PCs & WORKSTATIONS

MICRO BITS

Douglas Barney

Losing Dbase ball game



Kick 'em when they're down. The news from Torrance, Calif., has not been good. Ashton-Tate has product problems, inventory problems, money problems and an immense image problem. Like curdled milk, Ashton-Tate has seen better days.

Things used to be different. Ashton-Tate's profits used to rise steadily, and it used to make bold, expensive corporate acquisitions. Along the way, it gained a near monopoly in the personal computer database market and amassed a war chest that would make any capitalist proud.

The company's proudest achievement was the development of a top-notch marketing machine that locked competitors out and put Dbase into the

Continued on page 41

Inside

- Apple to use bargain-basement clumping when its portable Mac hits the streets. Page 39.
- EISA team says chips are on schedule. Page 39.

IBM plans OS/2 raid on DOS

BY PATRICIA KEEFE
OF STAFF

RESEARCH TRIANGLE PARK, N.C. — It's going to take a lot more than add-in memory problems to push users toward IBM's self-proclaimed key to the future — OS/2 Extended Edition.

Instead, an admittedly stylized IBM has launched an all-out effort to confront any user confusion regarding its OS/2 strategy and product offerings.

At a briefing two weeks ago, IBM executives were rather nebulous about dates while outlining plans to outshine MS-

DOS, better communicate with users and tighten compatibility between Microsoft Corp.'s LAN Manager and its OS/2 LAN Server.

IBM also provided a glimpse of the capabilities expected under a 32-bit OS/2, which it expects to introduce sometime in 1990.

OS/2 is the cornerstone or window into IBM's Systems Application Architecture, according to IBM's Michael O'Dell, a LAN Server product manager. "We're not taking this lightly," he said.

Conceding that DOS is firmly entrenched in user accounts,

IBM executives pledged to make OS/2 support DOS applications better than DOS can itself.

"By letting you have five DOS sessions under Presentation Manager windows when dealing with an OS/2 application, we'll make the DOS user want to use OS/2," O'Dell said. "We've got to relate to the customer in a way that will make [OS/2] more acceptable."

Thus, IBM has mandated that development personnel participate in customer councils to ensure that products are developed that meet customer needs. "Customers today are more sophisticated; they know their in-

formation needs and the solutions they are looking for," said Richard Dougherty, general manager of IBM's Research Triangle Park facility.

On the local-area network side of the house, O'Dell stressed that "Extended Edition is the LAN operating system that IBM [will] build the future on."

IBM said it has already moved to increase the level of support for LAN Manager application programming interfaces (API) within LAN Server, which is based on LAN Manager. IBM now supports 89 of roughly 107 related APIs. "It is important to get to a standard offering," O'Dell said.

O'Dell also treated the pub-

Pricey Postscript fails to seize market interest

BY RICHARD PASTORE
OF STAFF

The latest model of IBM's Adobe Systems, Inc. Postscript-compatible laser printer will cost customers no more than did the older model it replaces, IBM announced last month. But despite such vendor attempts to hold the line, Postscript printers in general are still too pricey to catch fire in the laser printer market, analysts said.

Postscript-compatible printers have stalked out only about 20% of the market for printers that run at less than 30 pages/min., while Hewlett-Packard Co. Printer Command Language

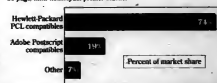
(PCL)-compatible printers have garnered more than 70%, according to Dave Hudson, an analyst at market research firm BIS CAP International, Inc. in Norwell, Mass.

A key reason for this disparity is cost, according to analysts. Despite a trend among Postscript-compatible printer vendors to provide more bang for the buck — as shown by IBM's announcement — price remains a sore point, analysts said.

"They are pretty expensive machines. The Postscript compatibility feature adds about \$2,000 to the cost of the printer," said Angie Boyd, an analyst at Framingham, Mass.-based In-

Long way to go

Postscript still trails Hewlett-Packard by a wide margin in the less than 30 pages/min. nonimpact printer market



SOURCE: INTERNATIONAL DATA CORP.

BY GARY HAYES, CHICAGO

ternational Data Corp.

Furthermore, "because of impending price cuts for PCL machines, Postscript printers are going to have a harder time growing as a percentage of the market," Hudson said. "They are going to grow, but I expect PCL printers to maintain a 70% share for the next couple of years."

IBM's new Personal Page Printer II Model 31 retains all of the features of its Model 30, adds several functional enhancements and carries the Model 30's price tag of \$4,999.

The new model is a 6 page/min., 300 dpi/in. laser printer that can emulate HP's Laserjet Plus, IBM's Proprietary XL and

Continued on page 42

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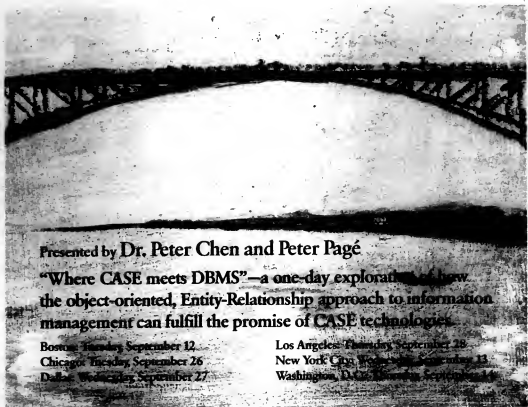
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Portable Mac anticipation rises

BY JAMES DALY
CW STAFF

When Apple Computer, Inc. officially takes the wraps off the long-awaited portable Macintosh later this month, they may also want to post an armed guard by the nearest machine.

Despite reports that the new model will be weighty in both price and poundage, users contacted by *Computerworld* last week are so anxious to use the portable that early sales could resemble clearance day at a bargain basement, with users elbowing one another to get their hands on one.

"Travel time is wasted without a portable Mac; we're dying to get one," said Leah Biagini,

manager of product administration at Aerofast Solid Boosters in Sacramento, Calif.

Because the firm is relocating to Mississippi, Biagini said she expects Aerofast's executives to hungrily grab portable Macs for the time they spend traveling between the two locations.

The debut of the portable, which is expected Sept. 20, has been the subject of regional speculation.

Company insiders say the portable Mac will cost around \$6,500 — more than double the price of most portables — and come with a 40M-byte hard disk drive and 2M bytes of random-access memory.

It is also expected to tip the scales at between 15 and 17 pounds, significantly heavier than the 6.5- and 4.5-pound laptop personal computer models recently introduced by



Toshiba Corp. and NEC Corp., respectively.

However, users seem ready to turn a blind eye to these inequities. "I just don't want to have to deal with a portable using the MS-DOS interface; it's like stepping back to the stone age of computing," said Miles Bailey, systems integrator at Lockheed Missiles and Space Corp. in Sunnyvale, Calif.

"When you connect another portable to a Macintosh network, it just seems like a waste of

time," Bailey said.

Bailey also dismissed the charge that the portable Mac may not fit on the small plastic tray attached to the back of an airplane seat. "So, I won't use it on an airplane," he said.

Peasant vendor

Potential users also seem to be ready to forgive Apple for the expected high price tag. "Six or seven thousand dollars is peanuts if it can make a senior executive earning \$150,000 to \$300,000 a year more productive," said Rick Christensen, manager of automation support at the Manville Corp. Technical Center in Denver.

Still, budget-conscious information systems executives are hoping that Apple will temper the cost.

"We'd prefer both the price and weight to be lighter," Bi-

agini said. "Hopefully, it will come down in future releases."

The portable Macintosh will be driving headfirst into one of the most tumultuous areas of the computer industry.

"Portables are the industry's most rapidly growing category," said Dick Shulter, president of the New York-based Technology Partners research organization. "Over the next few years, portability will become as commercially significant in computers as it is now in typewriters, televisions and stereo equipment."

In addition, the impending announcement is also sure to spark close companies. Already, Walley Systems in Boulder, Colo., has claimed that it will begin shipping a \$2,995 nine-pound Macintosh-compatible portable within weeks of Apple's announcement.

EISA and MCA fight a standards battle

BY MICHAEL ALEXANDER
CW STAFF

Despite rumors to the contrary, the Extended Industry Standard Architecture (EISA) bus is right on schedule, according to Intel Corp., manufacturer of the EISA chip set.

The EISA bus is being espoused by Compaq Computer Corp., Zenith Data Systems and seven other firms as an alternative to IBM's Micro Channel Architecture (MCA). Supporters of EISA contend that IBM is attempting to flex its muscle in the personal computer market to force an incompatible bus architecture on unwilling customers.

For its part, IBM argues that MCA provides a platform for an entirely new way of computing in

which users will want to juggle several tasks and communicate with a variety of devices simultaneously.

The so-called Gang of Nine EISA proponents banded together a year ago to introduce the EISA bus; at that time, they predicted that PCs using EISA technology would be on the market by the end of this year. But some analysts and other industry observers have suggested recently that the EISA chip set would not be ready in time for a December launch.

For example, Kimball Brown, an analyst at Prudential-Bache Securities, Inc., wrote in the firm's newsletter for investors that the EISA chip set had not been fully debugged and hinted that Intel may miss the planned

September production date.

"The rumor is out in the industry," conceded Kristin Bailey, a spokeswoman for Intel. "All I can tell you is that there is nothing true to the rumor at all."

The EISA chip set is fully functional and debugged and will be in production in September as

has them in sample quantities for prototyping."

Compaq will have EISA-bus PCs on the market at the end of the year, said Fred Cutler, director of strategic marketing at the firm. "That's right on the money," he said.

The band of EISA supporters

WE SEE IT as a chance to clarify the issue that [EISA] is not a whole new standard but an *Extended Industry Standard Architecture*."

FRED CUTLER
COMPAQ

scheduled, she said. Tests of chip set samples revealed only a short list of errors, requiring only minor modifications of the masks used in the fabrication of the chip sets, Bailey added.

"We have 50 active designs in North America," Bailey said. "Everyone who wants devices

has stepped up its efforts to promote the technology in Europe. Two weeks ago, the Gang of Nine formed EISA-Europe, an organization made up of each member's European affiliate.

At this point, it is unclear whether corporate customers will buy into the notion of the

need for EISA machines when the technology finally does hit the market. The two bus architectures are more alike than different, and the marketing battle will be one based on subtle technical issues rather than dramatic differences in performance.

The Gang of Nine has been waging its marketing battle on the semantics front by referring to IBM's original Personal Computer AT bus architecture as the Industry Standard Architecture in an attempt to maintain a link with the proposed EISA bus. "We see it as a chance to clarify the issue that [EISA] is not a whole new standard but an *Extended Industry Standard Architecture*," Cutler explained.

"The playing out of the technical aspects of the bus implementation is not going to make much difference to the end user," Cutler added. "That is not a key issue. The important question is whether a single-vendor-driven standard is appropriate for the industry."

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Commodore, Amiga may get Unix

BY PATRICIA KEEFE
OF STAFF

WEST CHESTER, Pa.—Harry Coppersman certainly has his work cut out for him during the next two years. Not only has the IBM and Apple Computer, Inc. veteran been appointed pres-

ident of Commodore Business Machines, Inc., a notorious hot seat, but he is also charged with plumping up Commodore International Ltd.'s long-sluggish U.S. sales.

Backed by heavy promotions, a management overhaul, revamped distribution and careful-

ly picked vertical markets, Coppersman has chosen the proprietary Amiga over Commodore's IBM-compatible line to lead its latest charge into the federal, business and university market segments.

Moreover, the banner waving overhead will herald Unix, not

OS/2. "From our perspective, it's not been proven that OS/2 or [IBM's] Presentation Manager are the wave of the future," said David Archambault, business markets director.

The Amiga's strengths lie in multitasking, color graphics and speech synthesis capabilities. Commodore is targeting desktop publishing, video, graphic design, interactive computer train-

ing and other multimedia applications.

The Amiga essentially comes in two models: the 500 family, which costs \$799 and requires external peripherals, and the 2000 series, which has internal slots. Pricing for the 2000 series starts at \$2,195.

Both machines offer windowing and can run proprietary Amiga DOS and Unix. A bridge card provides compatibility with Intel Corp. 8088- or 80286-based micros running MS-DOS, and a third-party package provides a color X Window System implementation.

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Commodore's Coppersman
will lead the way with Amiga

These features, combined with low prices, have won the Amiga favor within the research and entertainment industries. Archambault claimed the Amiga can provide true multimedia at \$4,500 per user vs. \$15,000 or more per user on an IBM or Apple system.

Marvin Weinstein, a research scientist with the Stanford Linear Accelerator Center, concurred. "OS/2 multitasking really isn't there yet, and most people hate Unix anyway. A similarly configured Mac costs twice as much," he said.

The Amiga is "smart enough to do what you want" and allows users to remain logged into a mainframe without being networked. Users log into the mainframe as color graphic terminals using REX exec. They can pursue multiple windows in native mode or run Digital Equipment Corp. VT100/200 and some Tektronix, Inc. emulations.

In the business and government sectors, however, the Amiga faces some formidable technical challenges. Coppersman and Archambault admit the Amiga is poorly networked at the low end. Commodore is talking with several leading local area network suppliers to extend support to the Amiga.

Coppersman plans to use Unix as a wedge into the government market. Commodore is talking with AT&T about offering Unix System V, Release 3.2 on the Amiga, possibly later this year. "It makes sense to put our resources into Unix, which is more heavily graphics- and video-oriented," Archambault added.

00001 3M

Barney

CONTINUED FROM PAGE 35

hands of end users, applications developers and information systems pros everywhere. For them, Dbase was, well, strategic.

That was then. Now, the success that seemed to come so effortlessly is quickly slipping away. What was a venerable marketing machine is now straining to convince a wavering customer base that all is well.

What went wrong at Ashton-Tate? The answer is obvious. It made the error that so many market leaders make: It became complacent and neglected to listen to customers. For some, that is the last error they ever get to make.

The company has failed to provide a compiler, even though customers have screamed for one, despite ample opportunity to do so. According to a former high-ranking Ashton-Tate source, the firm also gave up an opportunity to license the Sybase SQL Server, which it later had to go to Microsoft to get. As a result, Ashton-Tate has lost the aura of invincibility that saw it through its early days. It's high time the company breaks the old war chest open and starts throwing some cash around in intelligent ways, like on technology for a change.

Even then, it could take years to repair the damage because for years, Ashton-Tate neglected market forces that only the sharpest database strategists were aware of. By now, though, the terms are thrown around as if they always existed: client/server computing, SQL, database engines. While pioneers were

building systems such as SQL Server, OS/2 Extended Edition and graphical query tools, Ashton-Tate was synonymous with menus. While Lotus and Microsoft plotted strategies for next-generation database management systems (which haven't yet arrived), Ashton-Tate was adding commands to its aging procedural language.

The technology revolution has been slow in coming, which has kept Ashton-Tate out of more serious trouble. Last year, the database leader was able to cut a distribution deal with Microsoft, gaining access to the next-generation SQL Server.

All Ashton-Tate had to do was build Dbase into a product capable of treating the multitier SQL Server as just another

er Dbase file. Despite the blunders, Ashton-Tate was looking pretty good. That was until a series of fiascos centering around Dbase IV struck.

First, there was the late ship of Dbase IV, Version 1.0. That was bad. Then, there were the unending reports of bugs. Those were worse. Recently, though, came the announcement that an SQL Server version of Dbase IV was being further delayed, with no release date in sight. It just doesn't get any worse than that!

Unfortunately for users, Ashton-Tate's delays are also holding back the overall move to client/server architectures, something many users have been anxious to move to for some time. Users now have no idea when they can move

their Dbase environment to a more robust, mainframe-style architecture and thus are holding back on their own commitments to the client/server architecture.

Ashton-Tate clearly needs a rebirth. Fortunately, it has had several months to learn from its mistakes and is becoming a more honest, responsive and technically focused concern. It has also hired some of the best computer scientists money can buy. It needs to shut these guys in a room, tell 'em to forget about Dbase and then invent database technologies normal humans have never even thought about. Then, Ashton-Tate can start marketing again.

Barney is editor in chief of *Amiga World*.

A Strong CASE for Choosing Pilot Over Comshare.

OS/2

CONTINUED FROM PAGE 35

ering to a glimpse of product directions under a more robust, 32-bit OS/2 Extended. The general technology direction stressed a single-system image and included distributed systems support; ease-of-use, performance and security enhancements; cross-system and peer connectivity; portability; exploitation of new hardware technology (for example, reduced instruction set computing or Intel Corp. 80486 processors); and network management.

The November release of OS/2 Extended Version 1.2 will feature wide-area networking capabilities under the Communications Manager — 5250, X.25 and SNA Gateway for DOS and OS/2 clients. Remote data support, said to be the key to SQL and database access, will also be added. Other features to be added to the various layers of OS/2 Extended over a period of time include the following:

- 32-bit OS/2 — support for multiple DOS applications, 32-bit APIs and FFI kernel, Common User Access (CUA) enhancements, multimedia and object orientation.
- Database Manager — 32-bit support, OS/2 host query and host distributed database, OS/2-to-OS/2 distributed database, administration tools, media span, multivolume edit and update through join.
- LAN Server — DOS client enhancements, Netview alerts, Presentation Manager user interface, DOS Ethernet support, peer service, entry-level fault tolerance and server direct-access storage device management.

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PILOT
EXECUTIVE SOFTWARE

HP offers multiuser Vectras for Unix

BY J. A. SAVAGE
CRISTAL

Hewlett-Packard Co. will offer multiuser personal computer-based products for a low-cost method of small-business automation in the Unix environment by early next year, the company said last week.

In doing so, HP boosted the small but significant Unix vendor The Santa Cruz Operation by adopting SCO's operating system for its Vectra PCs. While SCO Unix has been available for HP computers, this is the first time the company has offered it as an HP product.

The move signals that HP is serious about spreading its own hardware to a low-cost server environment. As long as there is little need for memory-hogging applications such as graphics, consumers can support many users with one low-end Unix PC, according to HP.

The agreement also included Corollary, Inc., an Irvine, Calif., company, which will add an I/O subsystem that allows as many as 32 users for each HP Vectra.

Unix has been a major influence on HP personal computer use. Ten percent of its PCs based on Intel Corp.'s 80386 proces-

sors are running Unix, said Bob Puette, general manager of HP's personal computer group, "without directly marketing Unix on these platforms."

New corporate attitude

"Santa Cruz Operation is the de facto standard in [the PC] area," said Robert Herwick, an analyst at San Francisco-based Hambrecht & Quist. "It's another indication of HP's attitude that NIH [not invented here] is not applicable anymore."

While HP markets a version of Unix called UX on its minicomputers, the com-

pany decided it would leave PC multiuser Unix to SCO.

"HP UX is very large, not a lean, mean, simple Unix," Puette said. "It would be difficult to try to squeeze it down. And why reinvent the wheel?" There appears to be little internal effort toward compatibility between HP's Unix and SCO's, although Puette said there are about 70 third-party applications that run on both versions.

Corollary will supply "terminal concentrators" for the product. There will be a microprocessor board for each eight terminals. For each PC there will be a host processor board, according to George White, president of Corollary. The concentrators are connected via twisted-pair wiring.

Clipper 5.0 late, offer extended

LOS ANGELES—Clipper 5.0, Nantucket Corp.'s applications development software for personal computers, will miss its Sept. 15 delivery by as much as six weeks. When it does ship, possibly in mid-October, it will include some previously unannounced features.

Nantucket will extend its free upgrade offer. Buyers of the summer 1987 version of Clipper between now and the Clipper 5.0 ship date will receive a free upgrade. Version 5.0 was announced in June and will be priced at \$795.

Company President Larry Heimeninger related the delay to efforts to "ensure the proper integration of new packaging and documentation with stable, reliable software." He said the software industry has been plagued with flawed prematurely shipped products, adding that Nantucket wants to avoid this problem.

Other features will include local and static variables said to resolve naming conflicts in code and yield increases in speed as well as user-modified Gets, which can vary. Nest arrays of Gets, which reportedly allow user interface development previously only possible with low-level languages, will also be included.

Postscript

CONTINUED FROM PAGE 35

Xerox Corp.'s Diablo 630.

The machine's principal capability allows users to switch automatically from Postscript to non-Postscript output without having to go through the time-consuming hassle of physically changing the printer's switch settings.

According to IBM, this feature will be particularly helpful in shared systems and local-area network environments where not everyone on the system has ready access to the printer.

Other new features include the Diablo emulation and four Helvetica Narrow typeface styles, which bring the printer's resident typeface library to 47 styles.

The Model 31 can support a \$1,395 optional sheet feeder, which features two paper trays for 400 sheets and an envelope tray for 50 envelopes. Users of the Model 30 can upgrade to the Model 31 with a \$750 upgrade kit.

Tom bought Hewlett-Packard long



NEW PRODUCTS

Systems

Vermont Microsystems, Inc. has announced a price reduction on its Cobra Plus and Cobra Plus HS graphics processors, which run Manufacturing and Consulting Services, Inc.'s Anvii-1000MD computer-aided design and drafting software.

The processors are said to feature 1,024-by-768-pixel resolution display, an on-board CPU and noninterlaced screen refresh, providing flicker-free display.

The Cobra Plus has been reduced \$500 to \$1,495, and the Cobra Plus HS

with a 256-color palette has been reduced \$200 to \$2,195.

Vermont Microsystems
11 Tigan St.
P.O. Box 236
Winooski, VT 05404
802-655-2860

Xycom, Inc. has announced a processor module for Motorola, Inc.'s VMEbus that is based on Intel Corp.'s 80386 processor and has a choice of 16-, 20- or 25-MHz clock speeds.

The XVME-683 Personal Computer AT reportedly features 1M or 4M bytes of dual-ported memory, an optional math

coprocessor, a small computer systems interface, floppy disk controllers and a color graphics controller.

According to Xycom, the unit is packaged on two cards and has a battery-backed time-of-day clock and a watchdog timer for industrial applications, as well as two serial RS-232-C ports, a Centronics parallel interface and a keyboard interface.

The product can be used with other computers in the same VMEbus backplane to provide a multiprocessing environment. The price of a 16-MHz, 1M-byte version is \$4,500.

Xycom
750 N. Maple Road
Salina, Mich. 48176
313-429-4971

Sony Business Systems Corp. has cut prices on two of its desktop systems.

The MDC-16EX reportedly features an Intel Corp. 80286-2-based 16-bit CPU, a 5M- or 3M-in. floppy disk drive, 640K bytes of random-access memory and various interfaces and expansion slots. The MDC-17PlusSE is said to be a small-footprint desktop IBM Personal Computer AT-compatible computer that offers an Intel 80286-based CPU. According to the company, the unit is 6- to 10-MHz switchable and has 1M byte of RAM with a 15M-byte capacity and a 5M-in. floppy drive.

The MDC-16EX sells for \$905. The MDC-17PlusSE costs \$1,689.

Sony
51 Joseph St.
Mossack, N.Y. 07074
201-440-9300

Peripherals

Canon U.S.A., Inc. has announced a desktop electronic filing system based on magneto-optical disk technology.

The Canofile 250 reportedly offers a storage capacity of 256M bytes per disk side (up to 6,000 letter-size pages) and is capable of scanning as many as 45 letter-size pages/min. It incorporates an optical disk drive, LCD, a digital rotary scanner, a keyboard and a laser printer.

Scheduled for delivery in the first quarter of 1990, the system will carry a price tag of approximately \$15,000.

Canon
One Canon Plaza
Lake Success, N.Y. 11042
516-488-6700

Lotus Development Corp. has announced several output device drivers for users of the company's Freelance Plus 3.0 business graphics package.

According to the company, the drivers now include support for the Epson America, Inc. LQ 2500 and LQ 2550; the Oki-data Corp. 393C; the Hewlett-Packard Co. Deskjet Plus and Colorjet 7440; and several IBM models, such as Personal Page Printer II and Quietwriter III.

The drivers are available in 5¼- and 3½-in. media, and there is a \$20 shipping and handling charge for the disk.

Lotus
55 Cambridge Pkwy.
Cambridge, Mass. 02142
617-577-8500

Kraft Systems, Inc. has introduced the Kraft Trackball for the IBM Personal Computer AT, XT, Personal System/2 and 100% clone machines.

The input device is especially suited for graphics, computer-aided design, spreadsheet and word processing applications, according to the company. The product allows the end user to change

Continued on page 44

before he bought PCs.

When he got his first job on Wall Street, Tom's HP calculator was his most valued possession. It was the combination of innovation and reliability that gave him an edge. So when his Information Systems Manager recommended they go with Hewlett-Packard personal computers, Tom needed no convincing.

With Intel 286 and 386-based models, HP's line of Vectra personal computers suits a range of business needs. Vectra PCs easily accommodate expansion. You can get up to 8 accessory slots, 620 Mbytes of hard disk storage, and 16 Mbytes of RAM. And all models accept both 5.25" and 3.5" disks.

Beyond this, HP's adherence to industry standards ensures compatibility. Now, and into the future.

But the most important feature is one that Hewlett-Packard has offered for 50 years. Exceptional quality. This, along with HP's extensive network of trained, authorized dealers, gives you all the assurance you need. For the dealer nearest you, call 1-800-752-0900, Ext. 2821.

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North York, Ontario
Canada M2H 2M5
(416) 223-6196

from 10 to 1,150 dot/in. resolution and comes with a foot pedal option for one-hand operation.

Trackball costs \$119.95.

Kraft Systems
450 W. California Ave.
Vista, Calif. 92083
619-724-7146

Mannesmann Tally Corp. has introduced the MT906, a six page/min. laser printer that reported-

ly offers Hewlett-Packard Co. Laserjet Series II compatibility.

According to the company, the unit is capable of accepting any HP Laserjet font cartridge via two cartridge slots, as well as any soft (downloadable) font in HP format. Resident fonts are Courier Medium, Courier Bold and Lineprinter, provided in both portrait and landscape, the vendor said.

The printer sells for \$1,995.

Mannesmann Tally
8301 S. 186th St.
Kent, Wash. 98032
206-251-5500

Software applications packages

Sales commission software that tracks income for commissioned

sales firms and personnel available from Argonaut Systems.

Called **Sales Commission Tracker**, the menu-driven software program is said to report sales activity, sales order status, shipping information and distributor point-of-sale transactions status. Written for personal computers and MS-DOS-compatible computers with 512K bytes of random-access memory

and a hard disk, the software is reportedly not copy-protected.

The software is available in shareware, and the price is \$45. **Argonaut Systems**
No. 109-314
15466 Los Gatos Blvd.
Los Gatos, Calif. 95030
408-867-5029

Smart Software, Inc. has expanded its line of forecasting software for business and manufacturing planning.

Called **Smart Forecasts II Batch/300 Edition**, the software reportedly allows managers to forecast up to 300 product items or stock-keeping units simultaneously in a "batch mode" and can produce a real-time review of all the graphical forecast results.

Running on the IBM Personal Computer AT, XT, Personal System/2 and compatibles, it requires 640K bytes of random-access memory, a color graphics adapter card, a compatible graphics monitor and MS-DOS 2.1 or higher according to the company.

The product is available at a list price of \$2,500. Current users can receive a product credit. **Smart Software**
392 Concord Ave.
Bedford, Mass. 02178
617-489-2743

Eaton Corp. has announced a software package that enables users to check or change control functions and preset values of its **Ambassador series of count/control software.**

Called **Ambassador Profile**, the menu-driven software reportedly features upload and download capabilities, a print function and unit addressability for network use. It runs on most IBM personal computers or compatibles and costs \$95.

Eaton
901 S. 12th St.
Watertown, Wis. 53094
414-261-4070

A software program for personal computers from **Knowledgepoint** reportedly creates a complete employee handbook.

The menu-driven program is said to ask human resources questions on more than 50 subjects and then writes personnel policies tailored to the user's requirements. Technical requirements are said to include an IBM Personal Computer, AT, Personal System/2 or compatible with a minimum of 512K bytes of random-access memory and DOS 2.11 or higher.

An employer version (single-site license) sells for \$495, a consultant version (multi-site license) costs \$1,495, and a Policy Maintenance Program subscription is \$95 for one year or \$195 for three years.

Knowledgepoint
1311 Clegg St.
Petaluma, Calif. 94952
707-763-8333

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Madison, NJ 07940
Phone: 201 514 50 00

NETWORKING

DATA STREAM

Walter Ulrich

Practical security steps



Second of two parts

Security ensures users that their messages are distributed to and read by only their intended recipients. Business transactions must be shielded from view by a third party. But are electronic communications really secure?

Inter-enterprise communications already enjoy privacy and security protection on a par with more traditional communications. The Electronic Computer Privacy Act and computer fraud and abuse statutes grant electronic communications legal protection similar to that given letters and telephone calls.

Electronic communications offer somewhat more security than ordinary telephone calls. It is more difficult to intercept an electronic communication and decode a string of bits than to listen in on a telephone conversation. Electronic communications reduce physical handling of message content.

Therefore, electronic communications are more secure than traditional methods as long as good procedures are followed and the computer system is secure.

Continued on page 49

Ready for Intel's net cure-all?

ANALYSIS

BY ELISABETH HORWITT
OF STAFF

Intel Corp. recently revealed how it plans to merge its own multi-vendor communications platform with that of its recent acquisition, Jupiter Technology, Inc., into what it hopes will become a comprehensive solution for customers with complex networking problems.

However, even Intel indicated that there may be some question as to whether the market is

ready for such a connectivity panacea. One of Intel's few competitors in this arena, Northern Telecom, Inc., just took its Meridian Data Networking System off the market, having taken only \$20 million in orders during the platform's 10-month existence. Intel's Fastpath is designed primarily to provide high-speed channel-based connections between IBM hosts and either Digital Equipment Corp. VAXs or local-area networks, according to Intel spokeswoman Phyllis Stern.

In contrast, Jupiter's "multi-

function data communications computer" wears many different connectivity hats, providing a tailor-made communications platform for customers who need to implement a variety of protocols on a single, modular system, according to Jupiter President James Flach. The product starts at \$8,000; the platform's modular architecture, which consists of microprocessor units and "softblocks," allows it to act as an X.25 packet assembler/disassembler, network concentrator, LAN-to-host gateway and proto-

Continued on page 50

Hail the high-tech taxi

BY ROBERT MORAN
OF STAFF

Computers have caught cabs and could change both the fare game and the public image of cabbies.

A combination minicomputer and cigar box-size remote terminal — which is part high-tech siren for the static wit between cabbies and dispatchers and part cosmopolitan roadmap and tracking device — will take the public for a new kind of ride.

Jeff Priest, general manager of Checker Cab Co. — an association of drivers based in Detroit — said the taxi industry is moving into computerized dispatch, just as it moved to radios 40 years ago.

He is expecting a Cabnet system from General Systems Group in Ottawa, Ont., to change Checker's operations. Priest held off for several

years before deciding to pour more than \$1 million into a system for the association's 475 cabs. He said he was watching to



DAVID HIRSHMAN

see that the technology was more than just a gimmick.

"I needed to make sure that computerization would improve not only the service to the cus-

tomers, which is primary, but also that it would pay for itself with the ability to cover more fares per cab, per day," Priest said.

The system will take about five years to pay for itself and is

scheduled for completion in December.

For the United Cab Association, a 725-cab cooperative in

Continued on page 49

Novell, 3Com see SNA as key element

BY CHARLES W. SIMSON
OF STAFF

Squeezed between slumping earnings and the need to sell local-area networks to corporate IS, Novell, Inc. and 3Com Corp. have both placed major bets on the niche market for IBM Systems Network Architecture (SNA) connectivity within the last two weeks.

Each firm sees its SNA gateway products not as a major potential revenue source but as a critical element to selling network management solutions to Fortune 1,000 corporations.

Analysts and early adapters say the efforts are on target and that wide use of gateway technology will start to take off sooner than most pundits had anticipated. Last week, 3Com announced an SNA gateway to connect MS-DOS based workstations to IBM mainframes. A week earlier, Novell enhanced its existing IBM 3270 and SNA support.

Pillsbury Corp. will have 2,000 users connected to their backbone via Novell SNA gateways.

Continued on page 50

Inside

- Siemens, Rolm connect PBX systems, Page 51.
- Virtual Microsystems, Persoft bring closer PC-to-VAX links, Page 48.

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FIRST LOOK

DCA's Convertible: Is It IRMA? Or Sybil?

by David Strom

Though officially dubbed the IRMA 3 Convertible, a more accurate moniker for the new multiple-personality board from Digital Communications Associates Inc. (DCA) would be Sybil. A few deft twists of the wrist, and the board adopts whatever persona or configuration is needed at that moment.

The with of choice—Micro Channel or AT bus, coaxial or twisted-pair cabling, IBM- or IBM-A-style emulation—makes DCA's board an engineer's marvel. At the same time, however, the Alpharexia, Ga., firm wisely borrowed some tips from its competitors. For example, it uses single application-specific chips in its Novell line's POGX, a nifty configuration utility it is. Attachmate Corp.'s board, and two items found on many products: a built-in balun for twisted-pair wiring and downloadable microcode that makes upgrading firmware less painful.

But one thing the Convertible has that all others lack is the ability to run on all current PCs—Micro Channel architecture (MCA), PC and AT allies. And switching from classic bus to MCA takes even the most fumble-fingered user just a few minutes. Simply remove the back-edge connector, flip a series of switches, invert the busmaster and so that the coax Bayonet Nut Coupling connector is aligned with the rest of the card, and put everything back together.

We tried several 3870 software packages, including DCA's e78, e78 Plus and Crosstalk Mx-4. Relay Communications Inc.'s Relay Gold, Attachmate's Extrel and IBM's 3870 Emulation Program version 3.0. When the Convertible was configured as an IBM board supporting distributed-function terminals, the IBM, Attachmate and Relay emulation software worked flawlessly on both machines; this included the multiple-session support that Extrel provides.

TSO INDAFILE file transfer also worked well with the IBM and Attachmate products.

DCA's IRMA 3 Convertible Rides Either Bus

It's Simple To Switch from Standard Bus to MCA

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As far as we could determine, our software functioned identically when the COM-2000 board was swapped for IBM 2870 hardware. All we needed to do was configure the DCA personality and download the appropriate software.

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Have you looked into this yet?
Tom

**Customer Representative
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DCA

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Alpharetta, GA 30201-4199
1-800-241-4762, Ext. 54
In Georgia 404-442-4500, Ext. 54

New enhancements to IBM, DEC connectivity

BY RICHARD PASTORE
ENR Staff

Two companies announced products and enhancements last week that provide tighter integration between users of Digital Equipment Corp. VAXs and IBM Personal Computers last week.

Virtual Microsystems, Inc.'s V-Server/Gateway is designed to allow DEC VAX users anywhere on a Decnet network to tap into IBM PC-based local-area networks and access all PC LAN resources.

From a VAX terminal or Vaxstation, users can share data, run

applications and access peripherals such as laser printers resident on a PC LAN, the San Mateo, Calif., company said.

A key benefit of the combination hardware and software product is that it allows users to access PC LANs while continuing to utilize existing Decnet fa-

cilities. In addition, the product paves a smooth path to the PC LAN environment — a boon to VAX users unfamiliar with DOS or network operating system commands, the company said. Users can execute a single VMS command or menu option that transports them directly to the

PC LAN-resident applications.

V-Server/Gateway supports Novell, Inc.'s Netware, 3Com Corp.'s 3+ and IBM's PC-Net and network interface cards for Ethernet and Token-Ring.

The product also provides connections for four simultaneous VAX users and is Decnet-resident. V-Server/Gateway software runs on both the VAX system and the DEC file server and establishes the logical link between the VAX terminals or Vaxstation users and the PC LAN-configured processor.

The product is priced at \$15,000 and is available now, the company said.

On the flip side of the VAX-to-LAN connectivity coin, Madison, Wis.-based Persoft, Inc. has unveiled multiterminal versions of its

Systems software for MVS data centers:

Enter the world of total security, total support.

CA-UNIPACK SCA
SECURITY CONTROL AND AUDITING

CA-UNISERVICE II

800-645-3003

COMPUTER
ASSOCIATES

A KEY BENEFIT of the combination hardware and software product is that it allows users to access PC LANs while continuing to utilize existing Decnet facilities.

Smartterm 240 software, which emulates the DEC VT240 terminal, and Smartterm 320, which emulates the DEC VT320. These versions allow multiple PC users to communicate with DEC file servers and share software residing on a DEC network file server.

The products run on IBM PC and compatible machines under DOS 2.1 or higher. They also provide customized individual user setups, support an unlimited number of nodes and allow users to access information simultaneously, the company said.

The products provide access to DEC hosts over Decnet, supporting DEC's Local-Area Transport protocol for terminal-to-host communications. They also support data communications over such networks as Novell, Inc.'s Netware, 3Com Corp.'s Etherterm and Banyan Systems, Inc.'s Virtual Networking Software.

Smartterm 320 is priced at \$195 for a single user and \$895 for the multiterminal version, which supports five concurrent users and unlimited nodes.

Smartterm 240 requires 512K bytes of memory, while Smartterm 320 requires 320K bytes of memory and an IBM or Hercules color card.

Smartterm 240 costs \$345 for an individual package and \$1,495 for the multiterminal version, which also supports five concurrent users and unlimited nodes. Site licenses are available as well. The file server packages will ship later this month, the company said.

High-tech taxi

CONTINUED FROM PAGE 45

Philadelphia, \$1.9 million for computerization will wrest back control from the hands of cabbies.

With radio dispatch, "we just can't get the work out fast enough, and drivers have too many ways of interfering with the dispatch," said United Cab President Bernard Goldberg.

Radio dispatch prevents disgruntled cab drivers who contend that dispatchers favor certain drivers to squelch conversations between drivers and dispatchers by holding the speaker key on the microphone, Goldberg said.

The new system will eliminate the

need for dispatchers, assign work more equitably and allow the company to employ more operators to take calls, with a 50% increase in anticipated business, Goldberg said.

"We are hoping to increase revenues by 50%," Goldberg said. "If we don't do that, we've failed at what we are trying to do."

Goldberg said that the contract calls for a seven-year payout, which will be divided among the members of the cooperative. Both companies signed contracts with Gandalf for Calmate systems. Each cab will contain a Gandalf MDT 3602 mobile data terminal, which costs between \$900 and \$1,200 each.

The Calmate system, which Gandalf sells for approximately \$100,000, is

based on a Digital Equipment Corp. Microvax installed at the dispatch office. It also includes a communications controller and modems for radio transmissions between the office and cabs, which together cost approximately \$20,000.

In addition, a cab company must pay Gandalf to build its applications, including a digitized map of the city in which the cab company operates that is divided into zones.

With the Gandalf system, trained operators take calls, key addresses into the Microvax and transmit message packets through the controller and the existing radio system at 3.6K bit/sec. to the next available cab in a given zone.

According to Priest, drivers will use the terminals to search through their

zones to discover the best opportunities for business. The terminals, however, will not eliminate radio dispatch. A button on the mobile data terminal permits the driver to switch to a voice channel to obtain directions or to ask for more details, for example.

In addition, Priest said, Checker Cab will install a concealed emergency switch, possibly on the floorboard, to alert the home office to problems that may, for example, require the assistance of the police.

Unlike police emergency systems, which show locations on the dispatcher's map, Checker Cab's system will only show the cab's zone. However, Priest said, the zones in many cases are as narrow as four square blocks.

Ulrich

CONTINUED FROM PAGE 45

tem itself has reasonable security. More security is possible if encryption and other advanced techniques are applied.

Most large and many medium-size firms are already using inter-enterprise communications to some degree. What steps should they take to ensure their needs are met in the above areas?

Interconnection: Shop with an eye not only on what vendors deliver now but also on how committed they are to enhancing their offerings and migrating to industry standards. Do they support open systems? Have they demonstrated an ability to interconnect with other vendors at some of the many public interconnection demonstrations? Do they interconnect with competitive vendors or have they announced a firm date to do so?

Directories: Evaluate what combination of service-provided, host-based, personal computer software-based and paper directories will offer an acceptable level of addressing assistance and support for your company. The goal should be to provide better support than what is now available with telephone directories and then promote that fact.

Security: A balanced approach should be adopted. Only top management can establish policies on what levels of risk are acceptable in response to various kinds of potential threats. The danger is that top management will exaggerate the risk associated with electronic communications and overlook the risks associated with traditional methods. Then they will demand disproportionate security protection for electronic inter-enterprise communications, creating high costs and making electronic communications too expensive. Top management must be educated about the real level of threats and risks so that cost-effective security measures can be adopted.

In an ideal world, interconnection, directory and security issues are included as an integral part of the organization's information system and telecommunications strategy. Inter-enterprise communications can best be designed in concert with the development of the overall communications architecture. When such planning is practical, the end result is more efficient, more cost-effective and more flexible.

Ulrich is client services director for the information and telecommunications systems consulting section at Arthur D. Little, Inc., in Cambridge, Mass.

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Intel

CONTINUED FROM PAGE 45

col converter, Flach said.

Intel plans to market both its own Fastpath and the Jupiter line under the Jupiter name, with Fastpath bringing channel-based networking to Jupiter's platform, Stern indicated. Other upcoming additions will include LAN-to-LAN interconnectivity and Open Systems Interconnect support, Stern said.

The right platform

A major Intel concern, however, Stern admitted, is finding the right market or markets for the combined platform. Although a number of communications vendors

have acquired or developed products to cover a wide range of user solutions, few currently provide those solutions on one platform.

Intel's competition in the market, now that Northern Telecom is at least temporarily out of the picture, includes Computer Communications, Inc. and AT&T.

"There is a problem selling a system that does everything. The user asks, 'Does it solve this particular problem?'" Stern said. "We need a serious interest in an enterprise-wide, large network with lots of protocols."

Both Intel's Fastpath and Jupiter's platform have historically sold to three markets: systems integrators, which go in and connect users' incompatible systems for them; OEMs; and "sophisticated end

users" that have both the need for a wide variety of protocols on one system and the in-house expertise to tailor the platform to their needs, Stern said.

In the latter sector, Intel needs customer recommendations to build up sufficient credibility to convince customers that it offers the best solution in any given area, Stern indicated.

However, some existing end-user customers use the platform for very limited purposes, rather than for the all-encompassing multivendor connectivity advertised. For example, Kupper, Peabody & Co. uses Jupiter's platform simply as a way to allow users easy access to up-to-the-minute investment information on either its own IBM mainframes or on IBM mainframes used by financial information

supplier Automatic Data Processing, Inc., according to Cliff Mitchell, a network communications engineer at the New York investment and trading firm.

Kupper, Peabody could well be interested in integrating Intel's Fastpath into its Jupiter platform as a way to provide users at New York headquarters with fast access to the resources of its data center, which is shortly moving to Princeton, N.J., Mitchell said.

Intel will market the Jupiter-Fastpath product line through one division that will combine Intel's Systems Group and Jupiter under the Jupiter name and will be headed by Flach, Stern said. Intel plans to acquire other companies to broaden its reach in the connectivity market, Stern indicated.

SNA

CONTINUED FROM PAGE 45

ways by year's end, a measure of the firm's faith in an independent vendor's solution. Pillsbury already has an extensive SNA backbone in place and will spread the network to work-group LANs as quickly as possible. The technology has "almost unlimited potential," according to one Pillsbury wide-area network manager.

"We have IBM SNA networks in-house, but no gateways into them," said Bob Beatty, a computer engineer at the General Electric Co. Wiring Division in Warwick, R.I. "That kind of connectivity is still a ways down the road, but when we get there, we will consider a range of possible solutions."

While the need for SNA gateways is still remote for many end users, it is seen as critical to both Novell and 3Com's ability to compete with hardware vendors such as IBM and Digital Equipment Corp. for a long-term position on corporate enterprise networks. "To gain credibility from MIS, you have got to know how to SNA," said Mary Madala, a networking analyst at Forrester Research, Inc.

Both vendors subscribe to that analysis. "The SNA market will not go a long way toward making 3Com a billion dollar company," said 3Com chairman Bill Krause, "but it will be essential to selling network management to MIS."

Madala pointed out that where LANs have traditionally been decentralized purchasing decisions, they are fast becoming a corporate buy. To IS, networking means SNA. "We see the entire LAN market really starting to accelerate this year. With Novell's chief competition coming from IBM LAN Server, the SNA products are important," she said.

The market for X.25 and SNA gateway hardware combined amounted to \$40 million in 1988, according to Dataquest, Inc. Dataquest does not separately track software revenues for SNA gateways, but even if the software market was around \$80 million, as some analysts speculate, it is not a huge potential payoff given the number of vendors.

While analysts are waiting until the 3Com products ship to judge their viability, several critics contend that Novell should stick closer to leveraging the bread-and-butter Network operating system. "Novell management has taken its eye off the ball," says Brad Baldwin, a networking analyst for Dataquest. "SNA gateways have not been a major market. The trend of the technology is to connect LANs directly into mainframes."

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Rolm, Siemens strategic PBX systems to converge slowly

BY ELISABETH HORWITT
CW STAFF

BOCA RATON, Fla. — Shortly after finalizing the agreement to integrate its private-branch exchange (PBX) strategy with IBM's former PBX subsidiary, Rolm Systems, Siemens Information Systems has clarified how the vendors plan to connect — and to some extent converge — their respective PBX systems.

Siemens also announced a hybrid key-PBX system that fills a long-standing gap on the low end of its product line, observed Thomas Nolle, president of Hamdenfield, N.J., consulting company CIMI Corp.

While Siemens intends its own Saturn line to become increasingly integrated with the Rolm 9750 line during the next 10 years, it also wants to preserve the two lines' complementary features, which address different customer needs, according to Roger Bacon, vice-president of major communications systems at Siemens marketing arm Tel Plus Communications.

The 9750, for example, "is more like a mainframe" that addresses the needs of

turn into IBM's network management system, Netview, Siemens spokeswoman Susan Gwiff said.

Siemens' HCM 200 is a digital hybrid key and PBX system geared for small- to medium-size installations, the vendor said. It can be expanded inexpensively to a full-function PBX that supports up to 384 lines, Siemens said. The product is also said to support 19.2K bit/sec. asynchronous or 64K bit/sec. synchronous data transmission, local-area network connec-

tions and modem selection for modem pooling.

Priced at \$300 to \$500 per line, the HCM 200 "fills a void for customers moving out of analog-only key systems up to a full PBX," said HCM 200 product manager Barry Ross. Siemens' existing low-end 4080 analog hybrid system supports up to 80 lines.

The HCM 200 fills an important void for Siemens, whose Saturn line "is almost [exclusively] midrange, with a high entry threshold" that has discouraged users who are not interested in paying for the ability to move up to more functional systems at a future date, Nolle said. "If you're a user who doesn't want to do an upgrade to Saturn 2 or 3, then you're paying for upward mobility that you need

never apply," he said.

The HCM 200 apparently provides users with an entry point "on a more rational scale," making Siemens competitive for the first time in the high-growth market for systems under 100 lines, Nolle said.

While HCM 200's range of line support overlaps to some extent with Rolm's standard low-end switch, Redwood, the two systems are unlikely to overlap because Rolm sells the Redwood primarily to existing users who "want to equip smaller offices or warehouses inexpensively but also use existing Rolmphone sets," Gwiff said.

In contrast, Siemens subsidiary Tel Plus will sell the HCM 200 to small and medium-size accounts.

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WHILE SIEMENS intends for its own Saturn line to become increasingly integrated with the Rolm 9750 line during the next 10 years, it also wants to preserve the two lines' complementary features.

customers that want to centralize switching at one site, he added. In contrast, the Saturn is "more like a PBX LAN," which is optimized to support users who might want to distribute switching functions across a number of sites, Bacon said. "So there eventually could be one product line, but with two versions or sets of systems options" to address those two user bases, he added.

Siemens, with IBM's help, is devoting major research and development resources to integrating Saturn and the 9750, initially by connecting the two systems, Bacon said. An early phase of this effort will link the two PBXs via Integrated Services Digital Network (ISDN) connections, with enhanced communications provided by Siemens' Cornet networking system. Cornet, originally designed to provide Saturn with ISDN capabilities, will also provide enhanced messaging functions that go beyond ISDN for both Saturn and 9750 systems, Bacon said. "So, for example, [one type of PBX] will be able to camp on calls, not just send them" to the other, he said.

Other future integration plans include providing common station equipment and software across the two systems for functions such as voice mail and electronic mail, Bacon said. Cornet will also be a vehicle for first integrating Hicom — Siemens' overpress system — and then Sat-

NEW PRODUCTS

Local-area network software

Lotus Computing Corp. has announced an upgrade to its personal computer interface local-area network software product.

According to the company, PC-Interface 3.0 integrates DOS-based personal computers with the Unix environment, providing shared files, applications and printers. The interface also reportedly includes support for international character sets as defined by the Digital Equipment Corp. VT220 terminal, supports MS-DOS 4.0 and higher and provides multiple hosts with both Ethernet and RS-232 connections.

The price is \$450 for the Unix server with one DOS bridge and \$395 for each subsequent bridge.

Lotus Computing
9800 La Cienega Blvd.
Inglewood, Calif. 90301
213-670-6500

Quest Management Systems, Inc. has announced Incite, a microcomputer local-area network product that supplies information about competitive business factors used to make operating, tactical and strategic decisions.

Incite reportedly maintains text, image and numeric data on one's competitors and their operating locations, targeted markets, customers, current products and products under development, operating structure and other information. The program is said to capture data from various sources and then structure it into selected reports.

Incite requires IBM Personal Computers or compatibles; site licensing begins at \$10,000 plus customization.

Quest Management Systems
Suite 318
2301 West Big Beaver Rd.
Troy, Mich. 48064
313-643-6555

Technology Concepts, Inc. has upgraded its connectivity software to allow users to connect Apple Computer, Inc. Macintoshes with each other and with Digital Equipment Corp. VAXs on a Decnet network.

Version 1.3 of Community-Mac reportedly allows the user to copy files to or from a remote Macintosh, perform directory listings of folders and rename and delete files and folders on a remote Mac. The software provides various Decnet end-node capabilities, and support for an Ethernet controller has also been added.

License, media and documentation in quantities of less than 50 sell for \$495; a license only in quantities under 50 is \$350.

Technology Concepts
40 Tall Pine Drive
Sudbury, Mass. 01776
508-443-7311

Electronic mail

Voxlink Corp. has introduced a telephone interface for users of CC-Mail, Inc. electronic mail software for local-area networks.

According to the company, Voxmail reportedly enables E-mail users to access and reply to their messages from any telephone, allows the use of detailed mes-

sages and has the ability to forward and create messages. The interface is also said to work with many E-mail systems that support Novell, Inc.'s MHS standard.

The product is priced at \$3,995.
Voxlink
P.O. Box 23306
Nashville, Tenn. 37202
615-331-0073

IMI Computing, Inc. has introduced faxing capabilities for users of IBM's Distributed Office Support System.

According to the vendor, Rapid/Fax includes the addressing, routing, audit trail and logging functions on the MVS host

and the fax servers, which are personal computers connected to the network. Additional features reportedly include deferred transmissions and an automatically generated header sheet with the company's logo.

The price for the product license is \$30,000, with annual maintenance available for \$4,500.
IMI Computing
One Pickwick Plaza
Greenwich, Conn. 06830
203-661-4404

Lotus Development Corp. has announced an addition to its Lotus Express communication product for MCI Communications Corp.'s MCI Mail that enables the user to send faxes directly from a personal com-

puter without a fax board.

According to Lotus, the "fax pack" allows users to send a fax to multiple fax machines with the added advantage of sharper, easier-to-read text, because the document is sent digitally from a PC. The fax pack sells for \$10, and Lotus Express is priced at \$150.

Lotus
55 Cambridge Pkwy.
Cambridge, Mass. 02142
617-577-8500

An electronic mail product that connects Apple Computer, Inc. Macintoshes or a personal computer to a Macintosh has been introduced by CC-Mail, Inc.

According to the company, CC-Mail LAN Package functions with MS-DOS- or

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OS/2-based PCs, and the capability can be extended to E-mail users on remote local-area networks and to users connected via gateways to such mainframe mail services as IBM's Professional Office System, the vendor said.

It reportedly requires an Apple Macintosh Plus, SE or II, System 6.0.2 or higher and costs \$495. CC/Mail 385 Sherman Ave. Palo Alto, Calif. 94306 415-321-0430

Modems/Multiplexers

Intel Corp.'s Personal Computer Enhancement operation has announced the 2400EX, a Hayes-compatible 2,400 bit/

sec. external modem.

According to the company, the product provides full support for the IBM Personal Computer AT command set and will work with all personal computers that support asynchronous communications. The modem is priced at \$495 and comes with a five-year guarantee.

Intel CO-7 5200 N.E. Elam Young Pkwy. Hillsboro, Ore. 97124 503-629-7354

Applied Concepts, Inc. has introduced the Laser Link Fiber Optic Modem for data communications between standard computer parallel ports and remote peripherals.

Targeted markets include government and military installations with high-security requirements, as well as business environments that handle confidential customer data, according to the vendor.

A complete Laser Link Fiber Optic Modem system costs \$3,200. Applied Concepts Suite 201 10975 Torreyana Road San Diego, Calif. 92121 619-453-0090

Datacom Technologies, Inc. has announced the Model 302/304 Parallel Short Haul Modem, which has been designed to boost parallel data transmission distances.

The device is reportedly a combination

line driver and parallel/serial converter that features optically isolated data transmission and hardware handshaking capabilities.

The Model 302 parallel-to-serial transmitter is priced at \$156, and the Model 304 serial-to-parallel receiver sells for \$182, the vendor said. Rack-mounted versions of both units are available. Datacom Technologies 11001 31st Place W. Everett, Wash. 98204 206-353-9292

Links

Avistar Corp. has announced an IBM 3270 printer support product for IBM's Proprinter III series.

Called Pro-III, the plug-in card reportedly enables IBM's Proprinter III, XL, X24E and XL24E printers to be used in IBM 3270 mainframe application environments. According to the vendor, the product supports 16 international character sets and requires no additional hardware for installation. It is scheduled to be available in the second quarter and will carry a price tag of \$795. A one-year limited warranty is included.

Avistar 65 S. St. Rockford, Mass. 01748 800-289-2526

Infotron Systems Corp. has introduced the Streamline 25 packet/circuit switch—the latest addition to its family of intelligent network products.

According to the company, the product provides complete protocol independence and allows synchronous protocols such as IBM's Systems Network Architecture to be carried over a network with CCITT X.25 data.

The product reportedly incorporates X.25 packet-switching, transparent circuit-switching and high-speed multiplexing capabilities.

The switch is currently available and will be priced from \$15,000, according to the vendor.

Infotron Systems Cherry Hill Industrial Center Cherry Hill, N.J. 08003 800-345-4636

Adacom Corp. has announced the CP-150 Plus ASCII Printer Adapter.

The product was designed to enhance IBM 3270 printing functions, according to the vendor. It reportedly allows a single printer to simultaneously operate with a personal computer, an IBM host and an ASCII host, thereby eliminating the need for duplicate equipment.

The adapter is priced at \$1,295. Adacom 8872 Bond Overland Park, Kan. 66214 913-888-4999

Cast Technologies, Inc. has introduced its Model ENT-4303 IEEE 802.3 Ethernet transceiver.

Packaged in a metal enclosure, the unit is reportedly a collision-avoidance circuit that provides improved network operation. It is supplied with a choice of three different industry-standard cable taps for use with a variety of cabling schemes.

The price is \$265. Cast Technologies 10 Northern Blvd. Amherst, N.H. 03031 603-880-1633

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MANAGER'S JOURNAL

EXECUTIVE TRACK



Mike Ryan has been named director of MIS for McDonnell Douglas Field Service Co., an independent field service organization of McDonnell Douglas Corp. He is responsible for the direction of resources and management of the databases and all of the business information systems used within the Field Service Co.

Ryan was formerly president of Alert Computer Systems in Irvine, Calif. Prior to that, he spent four years at Braegen Corp. in Anaheim, Calif., as director of MIS. He is a graduate of Pepperdine University and is a veteran of the U.S. Navy. He resides in Lake Forest, Calif.

Warren Andrus was named vice-president and director of information services at American Savings Bank in Fullerton, Calif.

Andrus was most recently director of information services at Home Savings of America. The 30-year IS veteran holds a bachelor's degree from Whittier College and attended the University of Southern California Graduate School.

Steve Stuthard has joined Chemserv Services Corp. in Columbus, Ohio, as vice-president of information services. Stuthard was most recently vice-president of information systems at Calcor Stores, a division of Walco. Before that, he was vice-president of information systems at Federated Department Stores, Inc.'s Gold Circle Stores chain.

Who's on the go?

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Greener acres ahead in publishing

Farm Journal merges database, printing technologies to target readers strategically

BY AMY CORTESE
OF STAFF

What do a corn farmer in Iowa, a hog raiser in Texas and a cotton farmer in Georgia have in common?

Other than the fact that they are all farmers, not very much. That was precisely the challenge posed to Philadelphia-based Farm Journal, Inc., publisher of *Farm Journal*, a magazine read by roughly 900,000 farmers nationwide.

But through the use of sophisticated database and publishing technology, *Farm Journal* is able to target its readers' diverse interests and "custom-build" hundreds of editions tailored to a particular group, or even an individual.

As advertisers demand more focused audiences, more and more publishers are exploring the practical uses of target marketing, including such publications as *Time*, *Prevention* and *American Baby*. *Farm Journal* has been able to increase revenue and market share at the same time that the farming industry has endured hard times, according to company President Dale Smith.

"When you make it your business to serve farmers everywhere, you have to realize that farmers live in different areas, raise different crops and have different interests," Smith says. "Technology has enabled us to do a better job of serving farmers."

For each edition of *Farm Journal*, a core of editorial pages is combined with special-interest articles and advertisements to create many different issues. For instance, wheat farmers will receive an issue with articles related to wheat farming but not about livestock or corn.



Illustration by [unintelligible]

Advertisements can select from *Farm Journal*'s database to have their ads reach just wheat farmers in the Midwest or just dairy farmers of a certain size, for example. Neighboring farmers could receive respective issues of

Farm Journal that differ by as much as 50 pages.

Each month, a computer tape of *Farm Journal*'s reader data is sent to the magazine's printer, R. R. Donnelly & Sons in Chicago. R. R. Donnelly uses a process it developed called Selectron binding, where computers read the tape prepared by *Farm Journal* and select the mix of articles and ads

Continued on page 59

Linkage Project takes it from the top

BY ALAN J. RYAN
OF STAFF

Cigna Corp. believes the linkage between business and technology is mighty important — so important, in fact, that the Philadelphia-based insurance company is in the midst of an estimated \$2 billion, five-year project called Technology Linkages that got its start last year.

The program is headed up by Cigna Systems President J. Raymond Caron, who is making sure that Cigna makes the right investments in technology to support its business strategy. Cigna believes those investments must be used to attract and sustain competitive advantage. Caron will be armed with his \$340 million or more annual information systems budget to achieve this goal.

Cigna Systems has been working with each of the company's business sectors to determine how technology

programs are linked to the business strategies. In doing so, each business sector's technology capability was fully evaluated, and systems that provided a technology-based sustainable competitive advantage (SCA) were sought.

The 20-member group that studied the linkages also looked for commonality across all the company's various organizations when it reviewed the sector assessments. They looked at the SCAs for each area and noted the characteristics they had in common. The group then observed other areas with some of those same characteristics and the potential for developing an SCA in the future, Caron said.

Consequently, Caron got a good sense of what his own area, systems, could do better. He says that Cigna Systems has completely revamped its office automation strategy, taking it from an eclectic environment to one

with the IBM Personal System/2, OS/2 and OfficeVision as standard platforms.

Caron expects that perhaps some mistakes will be made along the way; after all, he notes, five years is a long time. "We are trying to select the best platform that we can find at the time and make a long-term strategic choice," he explains. To help combat any problems before they start, Caron says that Cigna conducts prototyping and experimenting before making decisions.

The management of change is a very important aspect of the company's linkages program. "It is not just having to build the applications," Caron says. "It is managing the change in terms of how the work is going to change, how job change, how training of the employees changes and ensuring that the environment you're going to install the system in is one that will produce the benefits that you want."

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Kodak/IBM:
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Perhaps not since George Eastman started his camera company in 1880 has there been such attention focused (no pun intended) on Rochester, N.Y.

Four weeks from today, IBM will officially become Eastman Kodak's data center manager, and a lot of people will be watching. To many, the relationship that the two companies formed earlier this year is a laboratory test bed for changes in the way information systems will be managed in the 1990s.

An increasing number of firms are looking at their IS operations and asking one simple question: "Are there any parts of what we are doing that could be done cheaper and better by someone else?"

An impressive roster of Fortune 500 companies — Kodak, Heinz, American Standard and Allegheny Ludlum, to name a few — have been asking that question. So far, most of them believe they have made the right choice in out-sourcing some or all of their IS operations.

Whether or not saving money is the primary motivational factor — and it usually is — IS executives say they also enjoy the freedom to focus on end-user partnerships and strategic systems instead of third-shift staffing shortages and DASD glitches. "It's hard to believe," says top Kodak IS executive Katherine Hudson, "that any company gets competitive advantage from the way they run their computer room."

To the vendors, a "solution" used to mean that you don't sell only a CPU but also some sort of bundled hardware, software and support to meet a particular need. Now the definition is expanding to indicate a range of soup-to-nuts services that are blurring the lines between planning, consulting, development, installation, operations and support. No one, in a better example than the player called IBM.

Two years after its much-ballyhooed "Year of the Customer," IBM is showing real signs that it means what it says. All things considered, a two-year time frame to turn around a \$600 billion battleship loaded down with mainframe myopia is not a bad performance, despite what Wall Street's short-term snipers may think.

The proof is in the paycheck: Last year, IBM changed its sales force compensation basis from points awarded on systems sold or leased to a formula based on total revenue generated.

The IBM game is still very much account control. However, that now means maintaining a partnership, not a CPU migration path.

IBM is plowing through turf formerly

considered to be the province of firms such as Electronic Data Systems and Andersen Consulting. IBM's National Service Division, once known primarily for parts depots and board-swapping service reps, will now design, build and — if you follow Kodak's lead — run your data centers for you.

At the same time, EDS has entered the hardware business by buying a piece of NAS, Andersen is a major vendor of packaged software, Comdisco has jumped into IS consulting... lines are blurring everywhere. Just look at the parade of vendors all claiming to offer "systems integration," which I'm still waiting to see accurately defined in the commercial marketplace.

It's a confusing landscape, but what

clearly rises from the market hype is that vendors of all kinds want to offer more and more services. Some of those services, such as IBM managing Kodak's data centers, may replace the services that IS organizations have traditionally delivered to their end users. But if the partnership is managed properly, the IS executive need not lose control of the strategic components of IS.

A lot of eyes are on Kodak's Hudson to see if that indeed can be the case. If it works, others may follow Kodak's outsourcing lead. But all IS executives owe it to themselves and their companies to follow Kodak in assessing what options are possible in their own organizations.

Business authors such as John Naisbitt and Rosabeth Moss Kanter are con-

stantly urging America's senior executives to rethink their businesses. Don't just say you make automobiles or sell financial services. Who are your customers, and what are their needs that you're trying to meet?

It's time for the IS organization to go through this same rethinking process. A lot of people are watching Kodak to see if Hudson and her staff have found the right answer for the role of IS in the 1990s, which may not be known for some time. But other IS executives should not wait for the answers. They must do what Kodak has done — start asking the questions.

Wilder is *Computerworld's* senior editor, management.



Greener acres

CONTINUED FROM PAGE 55

based on that information.

Using this process, *Farm Journal* published a record 8,896 editions of one issue in 1984. Since then, the company has spun off four special interest magazines — *Beef Extra*, *Hog Extra*, *Dairy Extra* and *Top Producer*.

Custom building is made possible by *Farm Journal's* efforts to keep detailed information on its readers, including type of farm, location and operational interests. *Farm Journal* maintains the nation's largest agricultural database, containing information on three million farmers — both past and present *Farm*

Journal subscribers.

This information is collected when a reader subscribes or renews, and also by telephone centers that survey thousands of readers each year. More than a million updates are performed to the database each year.

"In the industry, there's a great deal of talk about what this technology allows publishers to do," Smith says. "But to take advantage of it, publishers and advertisers need to know a lot about their audience."

A refined database

Farm Journal has been collecting reader data and refining its database since 1962. The company made a decision to purge its subscriber list of "bad" names and only

send magazines to qualified subscribers. So while the overall circulation number is down, the magazine has greater penetration of its market today.

Maintaining a database of that size is not cheap. But Smith says *Farm Journal* is able to leverage the database investment for other uses, such as a profitable list-rental business. He says the database also allows *Farm Journal* to become more of a partner with its large advertisers, helping them to identify their present and potential customers and set up customer databases of their own.

The focus in publishing is shifting away from just sheer size of circulation, observes David Foster, president of Foster Associates, Inc., publishing consultants based in Mount Vernon, N.Y. "Advertis-

ers are seeking a more precise definition of the users and potential users of their product," he says.

The trend toward a more focused audience can be seen in the relatively recent proliferation of special-interest magazines. Mass appeal publications have responded by segmenting their large subscriber bases by demographic information that can be of use to advertisers.

"There's more and more information available, and it's getting easier to utilize," Kaslik says. "The ones that use it creatively will gain the competitive edge."

However, just collecting information is not enough. "Lots of people gather information," Kaslik says. "The ones that use it creatively will gain the competitive edge."

Suppliers of missing information

For publications that do not maintain that level of detailed information on their readers, service bureaus and other outside sources often supply missing information. For instance, Rodale, publisher of *Prevention* magazine and other publications, sends its subscriber list out to a service bureau that matches up the names of subscribers with other specific information on them.

Rodale is gearing up to produce two distinct versions of *Prevention*, for readers above and below age 55. While the

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Farm Journal published a record 8,896 editions of one issue in 1984. Since then, the company has spun off four special interest magazines — *Beef Extra*, *Hog Extra*, *Dairy Extra* and *Top Producer*.

editorial content will be the same in most cases, the advertisements will be geared toward the age groups.

In addition to custom issues, custom advertisements are being explored. With the advent of ink-jet printing, publishers have the ability to personalize advertisements, inserts or letters to customers within magazines.

Time, Inc. has experimented with personalized advertisements, and by January 1990, *Time*, *Sports Illustrated* and *People* will be on line with the technology, according to Donald Elliman Jr., executive vice-president of marketing at Time, Inc.

However, Elliman is aware of the potential "Big Brother" response to personalized ads, agreeing that many readers may be put off or offended by reading their name in an ad. But ink-jet printing can be used in less intrusive ways, he said, such as spraying the names of local dealers onto an ad.

One particularly successful use of personalization, however, has been personalizing renewal notices. *Farm Journal* has reported an increase in renewals with the use of personal renewal notices inserted into the magazine.

As publishers continue to deal with the increasing numbers of publications competing for readers' time and attention, technology will play an increasingly important role in identifying and reaching readers.



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CC Computers and Communications

CALENDAR

"Implementing and Controlling Changes in Information Systems," a two-day conference that will examine how to control and implement changes in systems during development and production, will be held Sept. 25-26 in Chicago.

Sponsored by the Institute for International Research and KPMG Peat Marwick, the conference will address topics that include working with multiple development platforms such as computer-aided software engineering and fourth-generation languages, tracking and linking the stages of software development, documentation and reverse engineering.

Speakers with an operations perspective will talk about scheduling and verifying changes, change management for telecommunications networks and service level reporting and enforcement. Companies represented will include Rockwell International Corp., The Travelers Corp. and Novistar International Corp.

For more information, contact Georgette Asherman, The Institute for International Research — Information Technology Division, 331 Madison Ave., 6th Floor, New York, N.Y. 10017-5102.

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Information Industry Association Conference & Exhibition, New York, Sept. 10-12 — Contact: Information Industry Association, Suite 800, 555 New Jersey Ave., N.W., Washington, D.C. 20001.

The Semiconductor Outlook, Boston, Sept. 11-12 — Contact: Conference Committee, Technology Partners, Suite 300, 419 Park Ave. 2, New York, N.Y. 10016.

Hardware '89, Dallas, Sept. 11-14 — Contact: Hardware '89, 365 Sylvan Ave., Englewood Cliffs, N.J. 07632.

Conference on Network Management, Phoenix, Sept. 11-15 — Contact: Delmar-Saville, Applied Computer Division, Alph. Park, 100 N. Campus Drive, Tempe, Ariz. 85281.

Telecommunications Management, Atlanta, Sept. 11-13 — Contact: Business Communications Review, 650 York Road, Haverhill, MA 06021-9330.

Data Administration Management Association Meeting, Washington, D.C., Sept. 13 — Contact: DAMA, Federal Capital Region, P.O. Box 9835, Arlington, VA 22209.

Business '89/First, The Business Users Conference and Exposition, New York, Sept. 13-14 — Contact: Conference Management Corp., 200 Connecticut Ave., P.O. Box 4990, New York, Conn. 06866-4990.

International Conference and Exposition of Man-Machine Perception Technology, Cleveland, Sept. 13-14 — Contact: Human Factors, Ergonomics Management Association, 7 Cambridge Drive, P.O. Box 919, Transford, Conn. 06871.

International DSD Production Profiles '89, Toronto, Sept. 13-14 — Contact: The National Institute, Suite 106, 6489 Carleton Ave., San Jose, Calif. 95123.

Midwest '89, Rosemont, Ill., Sept. 13-14, — Contact: Midwest '89, 8110 Airport Blvd., Los Angeles, Calif. 90045.

Global Changes and Their Impact on American Business, Stanford, Calif., Sept. 13-15 — Contact: Hoover Institution, Stanford University, Stanford, Calif. 94305.

NCMA Aerospace & Electronics '89, Santa Clara, Calif., Sept. 13-15 — Contact: NCMA, Suite 206, 2722 Marston Drive, Fairfax, Va. 22033.

Delays 1160/2300 Data Center Management Conference, New Orleans, Sept. 13-15 — Contact: Conference Systems, 3270 Lyngstad Court, Burke, Va. 22015-1431.

88 Open Central Meeting, Cambridge, Mass., Sept. 13 — Contact: 88 Open Computers Ltd., Suite 500, 8500 S.W. Schall Lane, Wilsonville, Ore. 97070.

Challenges for this Platform: Opportunities & Obstacles in the '90s, Cambridge, Mass., Sept. 13-14 — Contact: IDC, 5 Spear St., P.O. Box 905, Framingham, Mass. 01701.

Bynet User Group Conference, Framingham, Mass., Sept. 13-15 — Contact: Ben Harrison, Bynet, Southboro Office Park, 120 Turpin Road, Southboro, Mass. 01772-1800.

Capacity Planning Techniques and Experiences Conference, New Orleans, Sept. 13-15 — Contact: Information Management, P.O. Box 361554, Mpls., Calif. 94026.

Crisis Management and Disaster Recovery Planning Conference, Williamsport, Pa., Sept. 13-15 — Contact: Harris Data Associates, 430 Estate Commons, Essex, Pa. 15041-2431.

Human Resource Management Systems User Conference, New Orleans, Sept. 13-15 — Contact: Genov Software Systems, 5 Branch St., Methuen, Mass. 01844.

Meets in the Making Conference, Los Angeles, Sept. 13 — Contact: Black Data Processing Association, Los Angeles Chapter, 8209, 11881 National Conference, P.O. Box 91944, Los Angeles, Calif. 90095.

Introduction to Real-Time Market Data, New York, Sept. 13 — Contact: Datacube System, P.O. Box 294, Binghamton, N.Y. 13902.

Systems Integration Strategies, New York, Sept. 13 — Contact: Systems Division, 25 E. Fourth St., New York, N.Y. 10003.

Third-Party Computer Maintenance: An Industry in Transition or Survival? San Francisco, Sept. 13-14 — Contact: Frost & Sullivan, 184 Fulton St., New York, N.Y. 10038.

State Disaggregation and Communications Conference, Sept. 14-15 — Contact: Tolson Publishing Group, P.O. Box 1455, Alexandria, Va. 22313-9555.

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American Bankers Association National Bank Card Conference, Nashville, Sept. 17-30 — Contact: American Bankers Association, 1120 Connecticut Ave., N.W., Washington, D.C. 20006.

Real-Time Computing: Meeting the Demand, Washington, D.C., Sept. 18-19 — Contact: Kertes Associates, 40 Woodland Pkwy., Randolph, Mass. 02646.

Laptops '89, New York, Sept. 18-19 — Contact: Laptop Expositions, 20 Potosi Road, Springfield, N.J. 07081.

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Hayes



Utilities shine and the Southwest surprises as information executives stack up their chips

CIOs and IS VPs reap average compensation of close to \$90,000 per year

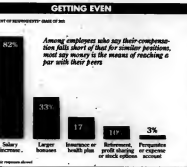
BY DAVID A. LUDLUM
CW STAFF

The good news is that some top information systems executives are making a lot of money. Many of them earn more than \$100,000 a year. A handful at the top of the heap reportedly approach the \$1 million mark.

The bad news is that IS managers below the top tier don't bring in earnings approaching the levels of highly visible chief information officers. According to *Computerworld's* third annual salary survey, CIOs and IS vice-presidents are earning \$89,158 on average this year in salary and additional compensation.

The average income reported by CIOs and vice-presidents in financial services and banking — a little less than \$100,000 — falls well short of the earnings of top IS executives at major New York brokerage firms and banks, according to Norbert Gottenberg, a recruiter at executive search firm Norman Broadbent International, Inc. in New York. Half a dozen of the best-paid IS executives in that arena earn between \$500,000 and \$1 million, he says.

Top dollar goes to CIOs who use computers creatively to give a company a uniquely competitive edge, as was done at American Airlines and Federal Express Corp., says John Sullivan, managing director at executive recruiter Korn Ferry International, Inc. in Boston.



A notch below the CIOs and vice-presidents, IS directors are chalking up average compensation of \$62,971, according to *Computerworld's* survey. Most other IS managers and supervisors report average earnings of a little more than \$50,000.

Rapid growth in IS compensation these days applies mainly to numero uno — the CIOs and their counterparts, according to Paul Berger, a Lawrenceville, N.J., consultant and former president of the Society for Information Management. "There's a big gap between them and the next level," Berger says.

However, not all companies are rewarding CIOs handsomely; many have not even appointed one. "I think a lot of companies still don't look at their IS organization as a strategic com-

ponent," says Bruce Walton, executive director at executive search firm Russell Reynolds Associates, Inc. in Boston.

This picture of restraint is reflected in *Computerworld's* survey. Along with top pay that tends to fall short of the six-figure level, managers report that salary increases for their departments this year average 5.9%.

To realize a big gain in pay these days, IS executives often must earn bonuses that are tied to accomplishing well-defined goals such as developing a specific capability within a given time frame, according to Davis Gallison, director of Northeast compensation consulting for Coopers & Lybrand in Boston. "We're really seeing a lot of that this year," Gallison says.

A slim majority of the individuals who responded to the survey expressed satisfaction with their salary, calling it about the same as what others in their position earn (see chart page 67). A third of them, however, say they think their salary is worse than what others make.

Among this less-contented group of executives, one-third say collecting a larger bonus would bring their compensation up to snuff (see chart above). Half that many, about 17%, choose improvements in health plans or insurance coverage. One-tenth name a retirement, profit-sharing or stock plan as a means of attaining income equity.

Senior executives in IS in Sun Belt

Thumbs up from Chicago, manufacturers

The way managers rate their pay doesn't always jibe with the raw numbers

regions tend to report greater earnings than their counterparts in Midwestern and Western areas, the *Computerworld* survey finds. There are two exceptions, however: Managers in Chicago stand relatively high on the regional pay scale, while their counterparts in Texas fall toward the low end.

Average compensation for CIOs and IS vice-presidents in various regions tends to fall into three tiers (see chart page 65). Managers from New York, Boston and California occupy the first tier, averaging \$99,000 or more.

In addition to offering healthy compensation, California and New England are the regions most likely to attract executives for the quality of life, partially offsetting the lure of even greater pay elsewhere, Korn Ferry's Sullivan says. "The only impediment is that the living costs are becoming prohibitive," he adds.

The second geographic tier includes Chicago and the three Sun Belt areas of Atlanta, Arizona and Florida, plus Washington, D.C., with its concentration of relatively low-paying government jobs. CIOs and IS vice-presidents in these areas report total compensation between \$86,000 and \$94,000.

In areas such as the Southwest, companies that use information technology aggressively offer unexpectedly high pay to help attract people from other regions, says Bob Morrison, director of the Prism research project at Index Group, Inc., a Cambridge, Mass., consulting firm.

The lowest geographic tier consists of the Midwestern and Western areas of Minneapolis/St. Paul, Detroit, oil-dependent Texas and Denver and the Pacific Northwest. Total compensation for CIOs and IS vice-presidents in these regions averages \$82,000 or less.

The same three-tiered structure generally holds true at the levels of IS director and IS manager or supervisor, with a few exceptions. Texas, for example, jumps from 11th place to third for IS directors and to seventh for IS managers and supervisors.

Most of the variations in pay by location reflect differences in costs of living, concentrations of large corporations and regional economic disparities. But when individuals consider whether their salary is better or worse than what other people in a similar position earn, those in Chicago rate their pay the most favorably, followed by their colleagues in Atlanta and Texas (see chart this page).

Industry analysis

CIOs and IS vice-presidents tend to fall into four groups on the basis of average pay according to industry (see charts page 1 and 66). Executives at utilities, a category encompassing both communications and power companies, stand above their counterparts in other industries, with an average compensation of \$103,375. Next come their colleagues in banking, financial services, insurance and manufacturing, whose compensation falls in the neighborhood of \$90,000.

Health care and wholesale and retail executives, whose average earnings are in the area of \$80,000, make up the third

REGIONAL RANKINGS

Employees in the Chicago area checked up the highest rating for their salaries, those in the Northeast the lowest



*1 = Better than others in a similar position, 2 = about the same, 3 = worse

MONEY MAKERS

Employees in manufacturing award their salaries the highest grade, those in government the lowest, but everyone says someone else makes more



*1 = Better than others in a similar position, 2 = about the same, 3 = worse

AVERAGE TOTAL COMPENSATION (SALARY PLUS BONUS)

	Company size by revenue or assets			
	Overall	Less than \$50M	\$50M to \$499M	More than \$500M
IS MANAGEMENT				
CIO/vice-president of IS	\$89,158	\$68,671	\$88,843	\$109,671
IS director	\$62,971	\$52,437	\$66,373	\$82,224
IS manager/supervisor	\$51,784	\$46,752	\$51,328	\$61,047
EDP auditor	\$46,114	\$40,500	\$43,513	\$48,057
END USER SUPPORT				
Information center manager	\$44,960	\$38,439	\$41,669	\$53,368
PC manager	\$39,723	\$33,838	\$40,923	\$42,186
PC specialist	\$30,800	\$28,357	\$30,525	\$33,331
COMMUNICATIONS				
Communications manager	\$52,147	\$40,206	\$49,662	\$58,515
Communications specialist	\$37,201	\$33,587	\$35,779	\$40,184
SYSTEMS AND PROGRAMMING				
Systems and programming manager	\$52,815	\$44,549	\$52,602	\$60,129
Project manager	\$49,152	\$44,482	\$48,499	\$52,820
Project leader	\$44,037	\$40,351	\$43,685	\$46,158
Senior systems analyst	\$41,446	\$39,300	\$41,118	\$43,631
Junior systems analyst	\$34,111	\$31,934	\$34,151	\$35,061
Senior programmer/analyst	\$36,835	\$34,341	\$37,149	\$39,676
Junior programmer/analyst	\$30,251	\$27,282	\$30,877	\$32,530
Senior programmer	\$32,573	\$31,228	\$32,007	\$34,615
Junior programmer	\$25,273	\$23,540	\$25,008	\$28,011
TECHNICAL SERVICES AND OPERATIONS				
Technical services manager	\$53,007	\$42,259	\$51,358	\$60,290
Senior operating systems programmer	\$43,344	\$34,950	\$43,091	\$47,420
Junior operating systems programmer	\$33,685	\$26,503	\$33,392	\$37,341
Data center operations manager	\$40,134	\$30,563	\$40,603	\$50,440
Data center shift supervisor	\$29,673	\$26,361	\$28,496	\$34,115
DATABASE GROUP				
Database manager/administrator	\$49,006	\$38,103	\$44,608	\$56,652
Database analyst	\$41,418	\$35,048	\$39,472	\$44,492

How the survey was conducted

The third annual *Computerworld*/DPMIA salary survey was conducted in June by the Research Services unit of IDG Communications, Inc. in Framingham, Mass.

The survey was mailed to 8,950 people selected from the membership of the Data Processing Management Association, top computer executives listed in the *Applied Computer Research directory* and *Computerworld* subscribers with titles of vice-president, assistant vice-president, director, manager or supervisor of information systems organizations.

With 1,628 completed questionnaires returned, the mailing generated a response rate of 18.2%. Four-fifths of the responses are from CIOs or other IS directors, managers and supervisors.

New York lights shine green for managers



AVERAGE TOTAL COMPENSATION: SALARY PLUS BONUSES

	Overall	Chicago	Atlanta	Boston	Texas	Southern California	Northern California	Florida	Denver	New York	Arizona	Detroit	Washington, D.C.	Minneapolis	Oregon/Wash.
IS MANAGEMENT															
CIO/Vice-president of IS	\$89,156	\$93,657	\$92,183	\$110,283	\$81,377	\$99,285	\$99,075	\$86,029	\$77,564	\$114,429	\$91,306	\$81,225	\$86,226	\$81,536	\$65,548
IS director	\$62,971	\$62,439	\$67,293	\$65,920	\$65,997	\$65,147	\$65,603	\$58,402	\$57,709	\$82,991	\$58,020	\$60,927	\$64,418	\$61,364	\$52,888
IS manager/supervisor	\$51,784	\$49,714	\$52,544	\$54,565	\$51,646	\$62,121	\$54,789	\$42,995	\$44,543	\$70,036	\$48,798	\$48,184	\$53,288	\$48,536	\$45,783
EDP auditor	\$46,114	\$47,429	\$56,250	\$48,667	\$41,825	\$53,817	\$46,167	\$43,500	\$40,486	\$53,167	\$38,375	\$44,400	\$47,030	\$36,250	\$42,200
END-USER SUPPORT															
Information center manager	\$44,960	\$44,840	\$46,735	\$45,491	\$45,967	\$50,650	\$47,944	\$36,226	\$40,843	\$57,582	\$43,291	\$38,727	\$49,958	\$40,595	\$41,975
PC manager	\$39,723	\$32,070	\$42,838	\$41,722	\$38,250	\$39,688	\$45,393	\$32,450	\$33,531	\$53,765	\$40,828	\$37,445	\$44,182	\$33,864	\$34,056
PC specialist	\$30,800	\$30,589	\$29,465	\$32,424	\$30,666	\$30,381	\$31,289	\$27,397	\$28,299	\$35,987	\$28,879	\$30,414	\$34,722	\$31,383	\$29,966
COMMUNICATIONS															
Communications manager	\$52,147	\$52,114	\$49,147	\$58,484	\$51,467	\$52,501	\$52,923	\$40,314	\$42,031	\$79,259	\$54,555	\$48,500	\$51,600	\$49,909	\$43,163
Communications specialist	\$37,201	\$37,842	\$34,021	\$37,139	\$37,079	\$39,240	\$39,145	\$33,346	\$35,082	\$60,050	\$37,588	\$34,297	\$35,538	\$37,059	\$34,191
SYSTEMS AND PROGRAMMING															
Systems and programming manager	\$52,815	\$49,835	\$52,288	\$52,566	\$53,935	\$54,112	\$58,796	\$47,886	\$46,915	\$70,800	\$52,900	\$49,491	\$58,395	\$50,493	\$47,347
Project manager	\$49,152	\$48,583	\$48,757	\$49,760	\$49,103	\$52,188	\$53,250	\$45,136	\$44,046	\$60,717	\$47,844	\$48,853	\$49,244	\$45,619	\$42,549
Project leader	\$44,037	\$44,628	\$41,816	\$44,997	\$44,237	\$45,000	\$50,063	\$40,714	\$40,520	\$49,905	\$42,700	\$42,629	\$44,652	\$41,959	\$42,778
Senior systems analyst	\$41,446	\$40,522	\$39,649	\$40,805	\$41,340	\$46,176	\$47,266	\$38,009	\$38,570	\$48,069	\$38,785	\$40,687	\$44,116	\$39,100	\$38,685
Junior systems analyst	\$34,111	\$31,276	\$32,225	\$32,920	\$32,331	\$34,672	\$39,560	\$30,000	\$32,809	\$36,692	\$32,458	\$34,857	\$37,906	\$33,278	\$32,784
Senior programmer/analyst	\$36,835	\$35,632	\$36,222	\$36,947	\$37,977	\$39,210	\$41,373	\$34,111	\$35,641	\$43,743	\$38,082	\$34,848	\$38,596	\$33,938	\$34,178
Junior programmer/analyst	\$30,251	\$26,660	\$28,191	\$30,827	\$29,797	\$32,703	\$34,297	\$26,911	\$31,039	\$33,226	\$30,118	\$28,224	\$31,886	\$30,339	\$28,076
Senior programmer	\$32,573	\$33,887	\$35,067	\$32,667	\$33,219	\$37,667	\$38,471	\$28,619	\$31,238	\$36,607	\$29,386	\$30,734	\$33,115	\$30,364	\$30,022
Junior programmer	\$25,273	\$24,440	\$24,530	\$26,507	\$26,193	\$26,279	\$28,512	\$22,173	\$24,492	\$27,648	\$24,069	\$24,140	\$24,962	\$24,548	\$24,721
TECHNICAL SERVICES AND OPERATIONS															
Technical services manager	\$53,007	\$47,423	\$57,815	\$51,674	\$55,121	\$58,700	\$57,771	\$50,139	\$48,817	\$74,700	\$53,083	\$49,221	\$52,988	\$51,304	\$47,397
Senior operating systems programmer	\$43,344	\$41,364	\$41,904	\$39,014	\$44,578	\$44,298	\$48,979	\$42,797	\$39,434	\$55,000	\$44,163	\$41,971	\$45,611	\$41,103	\$39,355
Junior operating systems programmer	\$33,685	\$30,316	\$32,836	\$29,254	\$35,833	\$31,271	\$38,635	\$34,066	\$32,311	\$37,547	\$36,409	\$32,375	\$36,533	\$31,727	\$31,628
Data center operations manager	\$40,134	\$37,479	\$39,970	\$39,552	\$42,737	\$39,134	\$43,086	\$36,141	\$33,630	\$52,207	\$41,336	\$37,950	\$45,602	\$39,451	\$38,871
Data center shift supervisor	\$29,873	\$29,243	\$28,093	\$29,849	\$28,594	\$30,596	\$33,319	\$25,145	\$27,210	\$36,176	\$32,170	\$26,970	\$30,641	\$28,702	\$30,996
DATABASE GROUP															
Database manager/administrator	\$49,006	\$49,391	\$52,562	\$48,029	\$48,563	\$49,016	\$56,731	\$46,500	\$43,851	\$60,442	\$46,371	\$45,409	\$53,720	\$46,466	\$43,494
Database analyst	\$41,418	\$40,378	\$44,364	\$38,533	\$39,833	\$45,000	\$47,300	\$39,500	\$38,872	\$56,500	\$40,583	\$38,937	\$41,659	\$36,893	\$39,292

CP CREDIT



Utilities, financial services nab top dollar

AVERAGE TOTAL COMPENSATION (SALARY PLUS BONUS)

	Overall	Manufacturing	Financial services	Utilities	Health care	Insurance	Banking	Wholesale/Retail	Education	Government	Other
IS MANAGER/ADMIN											
CIO/vice-president of IS	\$89,158	\$92,571	\$96,219	\$103,375	\$87,700	\$92,582	\$97,515	\$87,112	\$74,974	\$70,971	\$83,257
IS director	\$62,971	\$66,999	\$70,833	\$62,293	\$69,210	\$70,558	\$64,025	\$61,261	\$55,628	\$57,600	\$64,081
IS manager/supervisor	\$51,784	\$51,590	\$55,293	\$52,417	\$44,878	\$54,677	\$64,977	\$47,674	\$49,386	\$55,065	\$48,359
EDP auditor	\$46,114	\$46,318	\$54,000	\$45,556	\$41,875	\$45,549	\$49,823	\$48,357	\$50,000	\$41,270	\$39,700
END USER SUPPORT											
Information center manager	\$44,960	\$46,042	\$47,455	\$49,643	\$39,809	\$49,586	\$59,519	\$40,837	\$40,927	\$41,736	\$46,306
PC manager	\$39,723	\$40,959	\$36,375	\$41,393	\$32,222	\$45,111	\$46,563	\$34,900	\$36,120	\$39,837	\$39,382
PC specialist	\$30,800	\$31,110	\$28,056	\$31,937	\$31,039	\$31,514	\$33,542	\$27,802	\$29,661	\$30,425	\$32,837
COMMUNICATIONS											
Communications manager	\$52,147	\$56,181	\$84,152	\$50,875	\$38,554	\$49,198	\$67,365	\$52,939	\$45,183	\$45,803	\$50,596
Communications specialist	\$37,201	\$39,889	\$40,479	\$36,326	\$28,307	\$37,506	\$42,763	\$39,111	\$33,120	\$35,205	\$36,305
SYSTEMS AND PROGRAMMING											
Systems and programming manager	\$52,815	\$54,693	\$61,177	\$51,626	\$49,769	\$52,155	\$61,689	\$52,688	\$46,504	\$49,852	\$55,007
Project manager	\$49,152	\$50,626	\$58,077	\$48,294	\$45,190	\$49,799	\$53,425	\$46,128	\$44,326	\$44,684	\$53,362
Project leader	\$44,037	\$46,178	\$46,917	\$42,818	\$39,625	\$43,889	\$45,332	\$43,500	\$43,083	\$40,473	\$44,663
Senior systems analyst	\$41,446	\$42,395	\$43,224	\$43,448	\$40,442	\$39,906	\$46,738	\$40,941	\$38,197	\$39,631	\$42,462
Junior systems analyst	\$34,111	\$34,581	\$34,688	\$37,029	\$33,818	\$32,836	\$35,183	\$31,356	\$32,896	\$32,897	\$36,893
Senior programmer/analyst	\$36,835	\$36,580	\$36,650	\$37,995	\$36,809	\$37,634	\$40,578	\$37,001	\$34,113	\$36,427	\$37,317
Junior programmer/analyst	\$30,251	\$29,612	\$31,050	\$33,762	\$29,481	\$29,782	\$30,842	\$28,721	\$28,439	\$31,760	\$30,267
Senior programmer	\$32,573	\$33,177	\$32,808	\$33,611	\$32,145	\$32,490	\$38,289	\$32,822	\$30,627	\$31,143	\$32,035
Junior programmer	\$25,273	\$25,054	\$25,400	\$32,735	\$24,457	\$24,687	\$26,838	\$23,692	\$23,800	\$26,183	\$25,290
TECHNICAL SERVICES AND OPERATIONS											
Technical services manager	\$53,007	\$53,603	\$63,077	\$55,041	\$50,773	\$54,815	\$60,941	\$49,533	\$45,597	\$48,015	\$56,817
Senior operating systems programmer	\$43,344	\$42,187	\$46,600	\$46,233	\$40,500	\$46,563	\$49,783	\$40,270	\$38,895	\$41,690	\$44,890
Junior operating systems programmer	\$33,685	\$32,669	\$35,433	\$39,359	\$32,000	\$35,052	\$39,374	\$30,872	\$30,343	\$32,747	\$34,072
Data center operations manager	\$40,134	\$40,484	\$45,329	\$46,038	\$38,890	\$44,765	\$47,869	\$35,138	\$34,678	\$39,545	\$42,201
Data center shift supervisor	\$29,873	\$29,445	\$32,117	\$32,738	\$28,948	\$31,578	\$35,531	\$26,362	\$28,785	\$29,940	\$28,070
DATABASE GROUP											
Database manager/administrator	\$49,006	\$47,896	\$51,608	\$56,234	\$46,147	\$53,322	\$56,750	\$47,738	\$41,584	\$44,803	\$53,540
Database analyst	\$41,418	\$42,457	\$40,752	\$44,758	\$34,073	\$40,187	\$47,600	\$42,091	\$38,420	\$38,427	\$44,800

COW CHART

IS intensity drives compensation

Banks and insurers gain ground on securities industry

AVERAGE SALARIES AND BONUSES

	Average annual salary for 1989	Average additional compensation for 1989	Salary plus additional compensation	Average years of IS experience
IS MANAGEMENT				
CIO/vice-president of IS	\$80,564	\$8,594	\$89,158	16.3
IS director	\$58,756	\$4,215	\$62,971	15
IS manager/supervisor	\$49,489	\$2,295	\$51,784	12.1
EDP auditor	\$44,695	\$1,419	\$46,114	8.7
END USER SUPPORT				
Information center manager	\$43,672	\$1,288	\$44,960	9.7
PC manager	\$38,731	\$992	\$39,723	6.7
PC specialist	\$30,106	\$694	\$30,800	4.5
COMMUNICATIONS				
Communications manager	\$50,268	\$1,879	\$52,147	11
Communications specialist	\$36,473	\$728	\$37,201	7
SYSTEMS AND PROGRAMMING				
Systems and programming manager	\$51,088	\$1,727	\$52,815	12.8
Project manager	\$48,008	\$1,144	\$49,152	10.4
Project leader	\$42,900	\$1,137	\$44,037	9.3
Senior systems analyst	\$40,648	\$798	\$41,446	9.7
Junior systems analyst	\$33,401	\$710	\$34,111	5.6
Senior programmer/analyst	\$36,135	\$700	\$36,835	7.7
Junior programmer/analyst	\$29,750	\$501	\$30,251	4.1
Senior programmer	\$31,827	\$746	\$32,573	6
Junior programmer	\$24,789	\$484	\$25,273	2.4
TECHNICAL SERVICES AND OPERATIONS				
Technical services manager	\$51,143	\$1,864	\$53,007	12.7
Senior operating systems programmer	\$42,425	\$919	\$43,344	9.6
Junior operating systems programmer	\$33,154	\$531	\$33,685	5.5
Data center operations manager	\$38,986	\$1,148	\$40,134	11.4
Data center shift supervisor	\$29,179	\$894	\$29,873	8.4
DATABASE GROUP				
Database manager/administrator	\$47,804	\$1,402	\$49,206	10.4
Database analyst	\$40,463	\$955	\$41,418	6

CVI/CMAI

in Hartford, Conn.

Pay at utilities lags its top-notch status at the lower job levels of IS director and IS manager or supervisor. There, compensation for utilities ranks fifth among the nine industry groups. Health care compensation drops in rank at the level of IS manager or supervisor, where it is last.

Utilities also decline a bit in stature when individuals judge whether their salary is better or worse than that of other people in a similar position. In this category, managers in manufacturing put their salary the best score, followed by those in financial services (see chart page 64).

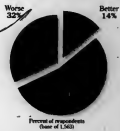
Variable reflections

Generally, variations in IS pay among industries reflect the extent to which the industries rely on information technology and top managers recognize the technology's value, says Index Group's Morison. These factors encourage high pay in financial services, he adds.

Compensation at major banks and, more recently, insurance companies has been catching up with the levels long paid in the securities industry, says Skip Tottle, director of information technology management at executive recruiter John-

GREENER GRASS

Employees who say their total compensation is worse than that of other people in similar positions outnumber individuals with the opposite view by more than 2-to-1



CVI/CMAI

son, Smith & Kniesely in New York.

At the bottom of the stack, the federal government has an antiquated pay structure that prevents agencies from attracting the people they need, says Perlin's O'Connor, whose firm recently studied federal IS salaries for the U.S. Senate.

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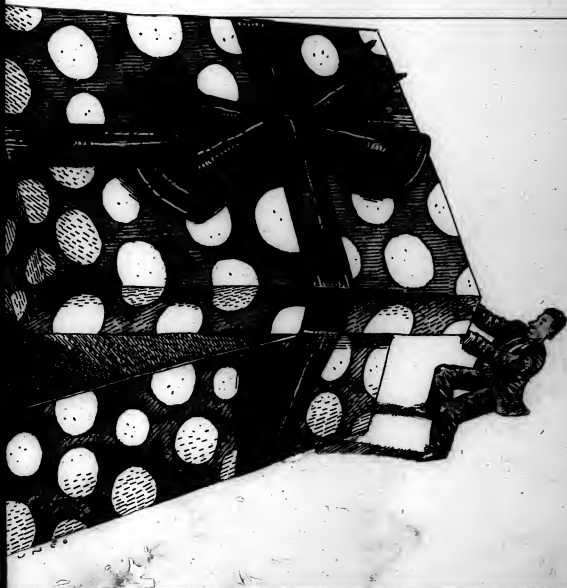
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BOOK REVIEW

The flip side of the Silicon Valley coin

BEHIND THE SILICON CURTAIN

By Dennis Hayes

South End Press, \$10.00

In *Behind the Silicon Curtain*, Dennis Hayes presents a devastating and bleak view of California's Silicon Valley, home to the largest concentration of computer and electronics firms in the U.S. He sees this area as a microcosm of the problems inherent in the information age. Hayes, who has spent much of the last decade in

various high-tech jobs, bases his book on interviews with electronics industry employees and thorough research of readily available publications.

With vivid, colorful images and hammering prose, Hayes describes a sociological, economic and environmental landscape in a way that highlights what the industry would rather not let us see. For example, what are usually considered progressive concessions made by high-tech companies to their baby-boomer employees, such as staggered work hours and aerobic classes, Hayes sees as more a method of squeezing work hours far beyond the mental-health

breaking point.

His theory is that the information age could be as destructive to the environment and the working class as the Industrial Revolution — and even more alienating. Hayes opens his book by drawing a convincing parallel between the factory towns of the Northeast and the California (and Massachusetts) electronics-based economy. Once

factory owners discovered that immigrants would gladly work for pitiful wages, their incentive to maintain safe working conditions was lost. Similarly, many semiconductor chip designers, he states, shipped their manufacturing sites

to locations in Indonesia or Mexico, while others exploited California's vast supply of undocumented workers.

Whereas Silicon Valley was once home to entrepreneurs who freely shared information — if not secrets — with like-minded, progressive developers, Hayes sees the once-positive creativity stifled by the current cutthroat culture. Now, "the entrepreneur... demands substantial start-up funding and a mean-spirited zeal to subdue competitors."

Much of the book is spent analyzing the fragmentation of the industry and its effect on the fabric of society. At the ugliest level is the clean-room worker in the semiconductor industry. The public may think of clean rooms as safe places. But while they may be clean for the semiconductors fabricated there, Hayes says they are full of toxic gases for the humans, which in the worst case can cause "chemically induced AIDS, depressing the workers' immune systems."

After the clean-room workers, Hayes deals with temporary employees. The electronics industry takes advantage, Hayes contends, of semi-skilled workers who are forced to accept part-time employment with no benefits and no job security. Hayes attributes the mercurial nature of high-tech companies not just to managerial cruelty but also to the assertion that "after decades of development, [the industry] still cannot make up its mind what it will make, how and where it will make it or whether it is in it for the long run."

This uncertainty is compounded by the secrecy required by many of the region's companies. The majority of electronics firms, Hayes points out, are subcontractors for the U.S. Department of Defense. As a result, workers are forced to deal with a situation in which the end product of the component or system they work on is top secret. Most workers know their products are going into bombs and fighter jets but protect themselves from feeling bad about it by saying, in effect, "I don't pull the trigger, so I'm not responsible."

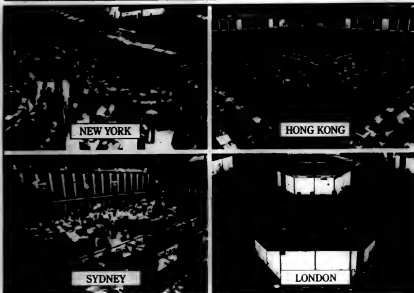
The alienation that results from not being able to identify closely with their products leads many Silicon Valley workers to a disturbing solution, Hayes finds. The incidence of the use of alcohol and other drugs on the job is alarming, especially considering the sensitive nature of the work. This may explain why electronics industry employees take part in counseling or drug abuse treatment programs at a rate of up to three times the national average.

Much of high-tech is inherently evil, Hayes says, particularly when it is building bombs and other deadly paraphernalia. For the most part, he says, software engineers have little idea of the end use of their skills. Breaking up a development project into modules obscures the end use of daily work and provides employees with a convenient way to pick up their paychecks and ignore the meaning of their careers.

Behind the Silicon Curtain is not fun reading, but it is compelling. If you need to ascertain the computer press will find the footnotes and the hint of an academician's style annoying. The notes lend credibility to the book, however, and attest to the extensive coverage area newspapers have given the electronics industry.

J.A. SAVAGE

Sevings is a Computerworld West Coast senior correspondent.



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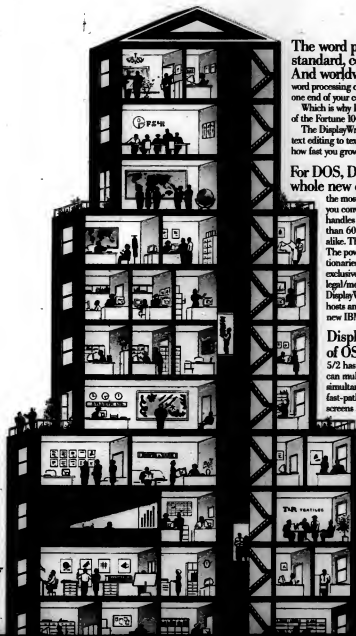


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New kid on the block

Tracking the evolution of the modern telecom manager

BY PAUL F. GREENE
and JERRY KANTER

The following two business situations undoubtedly have a savvy telecommunications manager behind the scenes:

The vice-president of sales arrives at 8:30 a.m. and immediately checks his electronic mail messages. He notes that the corporate office will announce at the close of the day the intended acquisition of a prominent competitor. One message gives details of the bid offer and the reasons for the ac-

street tomorrow. The executive sends a confidential electronic message to his 50 national account managers advising them to schedule meetings with their account contacts tomorrow morning. At 8:45 a.m., he leaves his office for his staff meeting.

A major package deliverer implements a nationwide packet-tracking system. When a package is picked up, the shipping document is scanned by a handheld reader. When the driver gets to his car, he transmits the information to the home-office computer system. When he arrives at the distribution hub, the package is scanned again. The procedure is repeated on the de-

However, the advent of the type of applications described above seems to have caught many businesses by surprise, even though telecommunications has been around for more than 100 years. The fact is that today, telecom can support and shape a firm's business, and the unparalleled growth in technology is increasing the ways to do it. The most important element in the formula — which need not be so surprising — is knowing how to manage the function. The first step toward achieving this goal is to place it in the right organizational position — a telecommunications manager.

In order to set up a successful telecom function, information systems managers must consider these factors:

- Where does telecommunications fit organizationally?
- What abilities and skills are required to man-

ufacturing sector's telecom budget and 69% of service's; data, 22% and 30%, respectively; text, 3% and 1.5%, respectively; and image, 1% and 0.4%, respectively. Projections are that the latter two categories will grow at a much faster rate than voice.

Observers skeptical of this prediction point out that prognosticators were saying 20 years ago that in 10 years the percentages would be 50-50 for voice and data. Although this has not occurred yet, it will, the only question is the time frame.

What has occurred is the evolution of the telecom manager within the business of information systems. Three general organizational models have marked the progress of the position since the early 1960s.

In the first model, the head of IS was the data processing manager. Voice communications was separate from DP, but the low volume of data transmission did

quisition. Because the company has a commitment to informing its customers of new products or organizational developments — a policy that has increased customer loyalty — the executive wants to inform his national account managers of this move. Then key customers will know as the information hits the

livery side, so that an inquiry in the home office about the whereabouts of a packet can be answered immediately. In all, the package is scanned six times from pickup to destination.

These scenarios have in common the use of telecommunications to give a firm major business and strategic advantages by compressing the information delivery cycle. In a growing number of cases, they provide a firm with a new service or product that affords real competitive advantage.

age and operate the function? • How are such people trained and developed?

As with the introduction of a new technology, the ways IS answers these questions will become the limiting factors to the effectiveness of the function.

Telecom has grown to be one-fifth of the information systems budget and is growing faster than the rest of IS. The Diebold Group, Inc.'s most recent telecom survey considered the manufacturing and service industries separately. In it, voice communications were for 74% of the

not justify a telecom manager. Systems analysts within DP handled what data communications there was as an offshoot of their application programs.

In the second model, which dates back to the 1970s and was predominant prior to AT&T's divestiture, IS remained highly centralized. While voice communications was still outside IS, there was a technical person who handled data communications. But that individual worked for a technical support manager who reported to the director of IS.

With the telephone company

Greene is assistant director of management information systems at Babson College in Philadelphia, Pa., and associate director of Babson's Center for Information Management Studies (CIMS). Kanter is executive director of CIMS.



DALE HARRINGTON

• The promise of a global village

- Another niche for techno-business managers
- Facilitating the integration of voice and data

divestiture in 1983, the decentralization of many IS functions to line departments and the centralization of a corporate architecture and policy/standards responsibility under a chief information officer, the title of telecommunications manager developed. The telecom manager usually reports directly to the CIO and handles both voice and data as well as image and text

communications. This is the dominant model today.

Some would say that telecom should be separate from IS, but the stakes are too high to deny that the telecommunications function belongs in IS and that it should include voice as well as data. Communicating data is integrally tied to the processing of it. This is true for data alone and is becoming more valid as technology facilitates the combination of voice, graphics, image and data for transmission purposes. The advent of electronic data interchange and related forms of interoperational systems are other compelling reasons for the union, as is the promise of a global village powered by a new wave of telecom technology.

Further, it appears that digital networks are proving to be more cost-effective and reliable than analog systems for transmission and switching, while labor costs for wire installation and maintenance continue to rise. These factors — plus the development of such transmission techniques as Integrated Services Digital Network — will inevitably speed the integration of voice and data. Combining

voice and data throughout the organization will continue to make more sense.

Accepting this as the organizational positioning of the telecom function, the remaining issues are the qualifications and training and development of the telecom manager.

Telecom qualifications

The industry is rife with words of future telecom technology and how the wondrous developments will have a global and competitive impact on corporations and on society. There are more acronyms and numerical and alphabetic shorthand per square inch in the telecom world than in

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A forward-looking infrared (FLIR) has been configured as a night sight for a variety of U.S. military weapons. The Hughes Aircraft Company-built Thermal Weapon Sight (TWS) has been adapted for use with Stinger missiles, machine guns, grenade launchers, and all crew-served weapon systems. The TWS is a developmental passive infrared sensor employing a thermoelectrically cooled focal plane array that allows soldiers to locate targets and see at significant distances in battlefield conditions. It has a standard NATO weapons mount, and its telescope and reticle are easily changed to perform various duties.

A small satellite earth station, capable of simultaneously receiving voice, video, and digital data information, allows companies to reduce their communications costs. The Hughes Personal Earth Station™ uses patented demand-assigned, packet-switched transmission techniques, in which different types of information are transmitted over a single communications channel as small, high speed data packets. Other types of communications systems require expensive, separate channels for voice, video and digital data information. The earth stations are part of Hughes' Very Small Aperture Terminal network, which provides end-to-end satellite communications for private business data networking and videoconferencing.

A new fiber-optic modem is the first non-cryptographic communications security product to be endorsed by the U.S. National Security Agency. It is approved for the protection of all levels of classified data. The FAM-131 modem is part of an intrusion detection optical communications system (IDOCs), developed by Hughes, that operates on the principle of alarmed fiber optics rather than conventional encryption. With no encryption signal to interfere with the data stream, the IDOCs provides high signal transparency, and can operate up to 13 megabits per second. An additional benefit is the elimination of crypto key management. IDOCs is intended for use between buildings in campus-like environments and local area networks for various applications including command and control and information management.

A new kind of optical fiber is airtight, more durable, and able to withstand higher temperatures than any other fibers. Scientists at Hughes have replaced the plastic buffer layers of traditional optical fibers with a thin aluminum film. While both types of buffer layers protect the delicate glass inner core from damage, the aluminum layer results in a fiber that is more rugged and retains its high strength longer. As a result, the new fiber is now showing up in a variety of applications, including automobile and rocket engines, temperature and pressure sensors, biomedical magnetic field sensors, and secure communications systems which can carry classified messages in plain English.

Engineers and scientists are eligible for approximately 100 Hughes Fellowships awarded for the pursuit of Master's and doctoral studies in Engineering and Science. All Fellows work full time at Hughes during the summer, with Work-Study Fellows working part time during the academic year and Full-Study Fellows attending classes full time. Fellows receive full academic expenses plus stipends for studies at approved universities. Additionally, Hughes offers a two-year, entry-level rotation program that enables qualified BS and MS graduates to diversify their engineering experience. For more information contact the Hughes Corporate Fellowship Office, Dept. 53, C1/B168, P.O. Box 45066, Los Angeles, CA 90045-0066. U.S. citizenship may be required. Equal Opportunity Employer.

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Where does the CIO fit?

The title of chief information officer has received a bit of a backlash, possibly because it connotes an image of an office apart, headed by an overbearing intelligence officer who controls most of the things you do relating to the use of information. However, the valid incarnation of the CIO concept is a sound one, especially as it relates to the telecom function.

IS' changing role in business strategy makes it mandatory for an overall architect to share data and communicate it with the people who make strategic business decisions.

Even though the CIO is separate from the telecom manager, he must certainly be responsible for the data and voice telecommunications infrastructure. The CIO's job is to provide the architectural framework to allow the effective functioning of those applications and systems that cross departmental lines.

Telecommunications by definition is a prime example of one of those systems. John Donovan writes in the September-October 1988 issue of *Harvard Business Review* about the importance of the CIO as network manager. He says, "The CIO must become personally and deeply involved in communications decisions, perhaps to the point of spending several hours a day on the design, maintenance and expansion of the physical network."

**PAUL F. FREEZE
and JERRY KANTER**

any other discipline. What is alarming is that there is scant advice on how to manage all of these new products and services. How does one plan, design and implement systems based on this technology? Who and where are the leaders that possess the necessary vision and knowledge to lead such efforts?

Managing telecom requires a combination of skills that is difficult in the same person. The role has evolved in the same way the CIO role has evolved. From a technical base, the job has grown in scope to the point in which management/business skills appear to be the most important attributes. It has grown from a closed environment with a few outside customers who accessed a company's proprietary telecom function to an open structure with many more clients inside and outside the company.

From the tech side

But many telecom managers have come through the technical route. They were either responsible for voice communications and data communications was added to their responsibilities, or they were in the technical IS world and took over telecom as it became embedded in IS. In fewer cases, the telecom manager has been a manager of another function who possessed enough technical perspective to be placed in the telecom role.

Modern telecom managers should combine the best skills of the technologist and the business-oriented manager. If they have not migrated from a DP environment, gaining a broad understanding of data processing is necessary in order to relate to the potential integration of data and voice throughout the network. The knowledge of and commitment to the placement of telecom within the totally orchestrated business is a must.

Telecom managers should have minds that are intrigued enough by the evolving technology that they will be able to make sound business decisions. Such inquisitive individuals must be able to do the following:

- Understand and move toward an overall networking architecture.
- Be able to specify meaningful standards and protocols to allow interconnection and integration.
- Have the capacity to scan the emerging technologies for incorporation into their organizations in the proper time frame.

Further, a detailed knowledge of how the telecommunications system may be extended, how its diagnostics function, how the network recovery operates, how components are substituted in the system and other basic control operations is central to total support of the business. The telecom manager must cultivate broad relationships with competitive vendors that could

THE TELECOM SETUP must appear to the corporation as a mandatory support system that enhances its competitive edge, rather than a large consumer of overhead that receives the first budgetary ax.

potentially support the mission. Currently, telecommunications vendors are the single largest source of knowledge for assisting a company in developing a

telecom strategy.

Knowledge of technology is of little value without the ability to create strategic and tactical plans that support the corporate


mission. The telecommunications setup must appear to the corporation as a mandatory support system that enhances its competitive edge, rather than a

large consumer of overhead that receives the first budgetary ax. The heart of most major telecommunications systems is an integrated network control system that cuts across multiple vendor product lines.

But the evolving nature and relative newness of the telecom manager's job make it difficult to define the job characteristics or find qualified candidates to

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AT&T Computers have
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Denver, Colorado
May 2, 1989

The Burlington Northern National TrackSmart® Center is getting rave reviews from its customers. And AT&T's distributed networked computer solution behind it is getting rave reviews from Burlington Northern. Burlington Northern's Lonnie Jarrell tells AT&T's Chris Turnquist why AT&T Computers provide a better way to serve customers of the longest railroad in the country.

Lonnie: We want to be known for superior customer service. So we planned proactive shipment monitoring through a new customer service concept—the National TrackSmart Center.

Chris: And better customer service means getting information to your customers, in *their* reporting format, as soon as your reps have it.

Lonnie: Exactly. All we had to do was listen to our customers to understand their transportation information needs. That was plenty of inspiration. We knew then that we needed a system that would let our reps instantly locate cars and report shipment status to customers immediately.

Chris: I remember when your reps could only handle one customer at a time. They had to query the mainframe database car by car. And *then* manually record their findings and send them out. Now each rep can handle up to ten customers, right?

Lonnie: Absolutely, plus the rep has more time to serve his customers better. Now they save time by tracking every car from *one* CRT. The AT&T 6500 Multifunction Communications System gives them multi-window

access to two synchronous sessions on our host, as well as async access to the TrackSmart application and AT&T Mail. Both TrackSmart and AT&T Mail run concurrently on the AT&T 3B2/1000 Computer. So the reps get information the second they need it.

Chris: And you're able to tap information easily.

Lonnie: Right. Because you molded AT&T distributed networked

computing to fit the Burlington Northern, rather than the other way around. You provide it all—computer networking systems and communications expertise. Plus you blend it all together with other systems better than any company I've ever seen.

Chris: I understand one customer wrote a BN rep promising him an official company ID naming him their Assistant Transportation Manager.

Lonnie: That's true. But you know, if we're going to be a partner to our customers, we have to be a partner with vendors who can take us in that direction.

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AT&T
Computer Systems

assume these important combined roles. Nevertheless, some basic attributes are necessary for those who are to achieve the proper balance. In addition to the attributes listed above, telecom managers must have the following "techno-business" integration-oriented characteristics:

- The ability to recognize that the company or business focus is primary and should be supported

and shaped by the technology.

- The realism to know that politics is an essential element in any systems architecture — while personally maintaining political neutrality.
- The possession of design and implementation experience in telecom or a related technical area.
- The foresight to balance long-term direction with short-term

interruptions while maintaining the confidence of senior management and peers.

- The ability to work within small groups and at the same time recognize the need to deal well with large, multidimensional audiences.
- A vision of what the company wants to be and do — and how a telecom network can support that vision.

• The interest in being a technological "metering agent" for the company, able to balance what could be introduced with what should be introduced.

- The business sense to know that budgetary considerations are important when introducing technology and building an information network.
- Strong conceptual skills that will allow understanding of a

networking architecture that can ensure technology improves and where complex pieces can work together.

• An innovative spirit that can discern those technologies that will emerge in practical form early enough to give the company a competitive edge. This means going beyond the technology gatekeeper role.

Finding all of these characteristics in one person is difficult, because seemingly conflicting aptitudes are required. Compromises will have to be made, but reviewing this list of job aptitudes can ease the task. The hiring IS executive should remember that the telecom manager's job is managerial and technical, not one or the other. The key is to maintain the proper balance, to know when to act one way and when to act the other and to be able to handle the duality.

TELECOM managers must recognize that the company or business focus is primary and should be supported and shaped by the technology.

The problem today is that many telecom managers are in their roles by default. This is not to belittle the incumbents, because in most cases, they have done yeoman's work — but it has been an uphill battle. Often, the people responsible for filling these positions are either unaware of the significant role telecommunications can play in an organization or else they do not realize the nature of the job of telecom manager.

The result is that there are neither accurate job descriptions nor effective ways to measure the performance of the job. It is, then, typically measured on an exception basis, noticed only if a telephone is not working, a voice messaging system is down, a customer cannot get his order into the system or network performance does not meet the needs of the organization.

Training and development
But where can IS find the expertise necessary to manage an activity that is getting more complicated by the day? How do you stay ahead of the curve? Do you have to go outside to a third party for network management — as Merrill Lynch & Co. is currently considering [CW, June 12] — or can you find or develop your own in-house talent?

The first consideration in answering this question is that the IS function may be facing a severe managerial and technical shortage in the next decade. The University of California at Los Angeles has been surveying

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incoming freshmen in colleges throughout the country for the last 20 years. The results show that the percentage of students indicating interest in an IS career has been declining from a high of 8.6% in 1982 to a low of 2.7% in 1988. Most colleges are well aware that the class size in IS courses is shrinking.

At the same time, the U.S. Bureau of Labor Statistics shows

that one of the fastest growing job fields will be in the information systems area. But when coupled with the World War II baby-boom figures and the secondary school dropout rates, it appears obvious that a serious shortage of both management and technical talent for managing the telecom area is inevitable.

However, the picture is not all dismal. Undergraduate and

graduate schools across the U.S. are gearing up to meet industry needs. There are currently more than 20 schools offering degrees in telecommunications — the University of Colorado and the State University of New York at Binghamton are two examples — and the number is increasing. Also, there are continuing education programs that stress the technical and managerial aspects

of running the telecom function. Among the most promising are the partnerships between education and business that are increasing throughout the country.

In addition, there is a growing number of training programs offered by equipment and service vendors, training firms and trade and consulting organizations. These programs offer a far

greater number of technical courses than management courses, however — a tendency that will have to change if business is to obtain the required telecom leadership. There is no question that a good deal of the management preparation in the telecom field will have to come from on-the-job training. This is a given in a discipline that is changing so rapidly. Nevertheless, educational institutions can improve the establishment of the right educational foundation for follow-on training.

Fresh Image needed

A major force that is actually reducing the number of students majoring in IS or telecom is the image projected by these disciplines. Recently, 40 students in a freshmen management class were asked to list the things that came to mind when they contemplated a career in information systems. A sampling of the replies includes "boring," "no fun," "difficult," "monotony," "repetitive," "sits at a desk and pushes buttons," "structured," "requires constant learning," "restrictive." If these are misconceptions — and many of those in the field would contend that they are — it is up to educators to change the image and to change the curriculum to conform to the actual environment of IS and telecom jobs as they exist in the business world. This will involve blending in much more of the management and people roles in the curriculum.

However, there still should be a place for the true technicians, those who like to delve deeply into the technology. IS managers must establish an environment that attracts and maintains these types of talents, too.

Thus, the situation is a serious one but not completely bleak. There are other firms just short of throwing up their hands and looking to the same solution that Merrill Lynch is now considering. You may have to resort to home-grown your telecom talent, but help is on the way.

Clearly, the telecommunications manager is a new breed of manager, a person who must truly blend the managerial and the technical. Yet some companies today are replacing their CIOs with a so-called "layman manager," a person with scant technical background but who is respected as a strong business manager. Senior management is following this approach in utter frustration and after a loss of faith in the purely technical types who have run the IS function until now.

This is not a recommended course of action for the IS role; it could prove disastrous in filling the telecom role. The overall leadership in the planning, design and implementation of telecom technology takes both a manager and a technician, not one or the other. ■

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Paat, buddy: Does this sound familiar? You soaked up every detail about these guys, but even now you can't remember which is the new head of Wang and which is the new head of Prime.

If, so, relax: I've got three pieces of good news for you. One: You are not alone.

Two: You are not losing your memory. Richard Miller comes to Wang and James McDonald to Prime with strikingly similar credentials. Both are reputed turnaround artists, imported to their posts fresh from a recent victory. Each apparently has proven ability to garner employee allegiance even while swinging the ax that is so often indispensable in turning around a troubled company. (While we're playing Guess Who's Resumed?, let's not leave out Anthony Craig, McDonald's predecessor at Prime, another articulate, hard-hitting, straight-shooting turnaround man with several recent notches in his belt—one, in fact, from GE, also a proving ground for Miller. Confusing enough for you?)

Continued on page 85

Girded for battle

Adobe heads for combat with former ally Apple

ANALYSIS

BY JAMES DALY
CW STAFF

In early July, Apple Computer, Inc. threw down the gauntlet in what could become a heated battle for the page-description language market. Apple officials announced that they were cashing in on its 3.4 million shares of the Adobe Systems, Inc. stock and indicated they might eventually compete head-to-head with Adobe's line of electronic publishing offerings.

"Might" subsequently shifted to "will" with Apple's announcement that it will offer an alternative to Adobe's popular Postscript page-description language by next fall.

The July announcement sent nervous whispering through the industry, not only because of the way Apple colored the announcement but also because of the questions it raised about the future of the long and close symbiotic relationship Postscript has enjoyed with Apple's Macintosh.

But at Adobe's headquarters in Mountain View, Calif., the mood is more one of anticipation than panic. Although company officials do not relish the idea of one day stepping into the ring with what had once been their closest corporate ally, they are clearly ready for battle when and if Apple decides to fully abandon its association with Postscript.

"It" could be the operative word. "Apple had to paint the worst possible picture to make it look like they were doing the right thing," said Adobe Chairman John Warnock. "But it's not really clear how much of this will actually happen."

Although Apple was rewarded handsomely for the move—a real-time price of \$79 million from what had been a \$2.5 million investment in November 1984—the sale was prompted by much more than a desire for profit-taking.

With the upcoming release of Macintosh System Software 7.0, Apple plans to include a new printer technology that will tighten the relationship between

P.S. We love you

Users' warm reception of Adobe's Postscript page-description language has rocketed the relative newcomer up the revenue chart:

- 1985: \$4.5 million
 - 1986: \$16.1 million
 - 1987: \$39.3 million
 - 1988: \$83.5 million
- But the firm's desktop publishing offerings compete with a list of tough contenders, including the following:
- Hewlett-Packard Co. (Printer Command Language)
 - Microsoft Corp. (PM-Script)
 - Sun Microsystems, Inc. (Folio)
 - Apple Computer, Inc. (font scaling technology)



Adobe's Warnock and Geschke are battle-ready

what users see on the screen and what they get from the printer. Although Apple said it would continue to support Postscript on the printers it has sold, it said it will announce an alternative to Postscript as well as competing font software by the fall of next year.

Warnock speculated that the move may have been initiated by Jean-Louis Gonse, president of the Apple Products division. "It's Jean-Louis' goal for Apple to own all the technology that is central to its operating system," Warnock added.

Continued on page 84

Taiwan software market expected to boom in 1989

IDG NEWS SERVICE

TAIPEI — The year 1989 should end with Taiwan seeing a 151% growth in its software application market, according to a survey conducted by the China Software Association.

The survey of 187 software firms also showed that the networking services market is expected to grow 123% and the professional services market by 103%. The data processing services market is unlikely to see a significant amount of growth, according to the survey.

Local software vendors said the explosive market growth is a result of the popularity of Intel Corp. 80386 personal computers and the rising importance of software. Vendors expect a higher growth rate next year.

Inside

- IS firms look to ease immigration laws. Page 83.
- Transfront and Nantec declare. "All for one and one for profit." Page 84.
- 3Com's Metacall finds old stamping grounds. Page 82.

Unruh crowned prince of Unisys

BY NELL MARGOLIS
CW STAFF

BLUE BELL, Pa. — James A. Unruh's election last week to the post of president and chief operating officer of Unisys Corp. gives the 25-year computer industry veteran an unofficial title as well: heir apparent to Chairman and Chief Executive Officer Michael Blumenthal.

The 48-year-old executive, who was instrumental in the creation of Unisys and has served the company as a director and executive vice-president since 1986, is widely perceived as a financial maven with sound managerial abilities. His advancement

to the corporate forefront at a time when Unisys is battling shrinking margins and spiraling costs in the course of a draw-out and draining product-line restructuring seemed to surprise few. However, the timing of Unruh's move to the front office was in all probability dictated as much by the need to clarify his unofficial status as by the need for his dollar-wise talents at the company's helm, according to analysts.

"This eliminates the contention [for succession], said Kidder, Peabody & Co. analyst William Easterbrook. "Having a competitive situation can work to the company's benefit for a

while, but let it go on too long and it will fester." Easterbrook alluded to the perceived runoff for Unruh's No. 2 spot between Unruh and fellow director and Executive Vice-President Curtis A. Hessler, who was promoted to vice-chairman last week. Both Unruh and Hessler will retain their seats on the board.

"Unruh has been the favorite ever since he became an executive vice-president," noted Easterbrook. "Hessler came in on the outside last because of the brilliant job he did in restructuring after the Sperry acquisition. In the end, though, the job went to the one who had the most experience."



Unruh's Unruh

That fact, said Michael Geras, who follows Unisys for Nikko Securities Co. International, is not without its irony. Unruh had a significant hand in building Unisys and for the last

two years has overseen the company's \$7.5 billion worldwide commercial marketing operation. Now he is charged with the mission of bolstering the firm's shaky financial stance—a move that the company recently said will necessitate cost cuts of approximately \$400 million over the next year. "The guy previously responsible for planning is going to have to do the cutting and restructuring," Geras said.

Particularly in light of the company's perilous financial straits, analysts agreed it would be a mistake to read the imminent departure of Blumenthal into last week's promotions.

"He won't step down until he's proven to the world that his vision of agglomeration works," Geras said.

3Com reorganization lands Metcalfe back in marketing

BY PATRICIA KEEFE
OF STAFF

SANTA CLARA, Calif. — 3Com Corp. has very quietly merged its hardware and software divisions, bumping co-founder Robert Metcalfe back to one of his old haunts — marketing. Effective Sept. 1, the change is expected to aid 3Com's product integration efforts.

Metcalfe, who has held almost every executive position at 3Com — except

president — most recently was general manager of the hardware-oriented Distributed Systems Division (DSD). That group has swallowed up the Software Products Division (SPD), and the combined entity will be headed up by SPD General Manager Eric Bealmon.

Meanwhile, Metcalfe said he has "joyfully" segued into the vice-president of marketing slot, vacant since early 1988. "The top marketing job at 3Com needs doing now more than ever," he said.

The move strips Robert Finocchio, vice-president of sales, marketing and services, of his marketing duties. "They probably told Finocchio to get out there and concentrate on sales," said Rich Kimball, a Montgomery Securities analyst.

Some analysts attributed this exercise in executive musical chairs to two disappointing quarters. "3Com orders have been sluggish since April, and we were working to manage our expenses in line with incoming orders," agreed Metcalfe, adding 3Com is "determined to avoid the layoffs" experienced recently by some competitors. Instead, redundant employees will be redeployed internally, he said. "Our real problem [overall lies in] having too many things to do and needing to act our priorities carefully," Metcalfe said.

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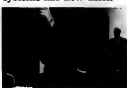
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IN BRIEF

Three hits

Restless-based professional services provider Keano, Inc. betted in its third 1989 acquisition: Com-Pri, a \$12 million professional services firm bought from Syracuse, N.Y.-based Continental Information Systems Corp. (CIS). Meanwhile, CIS is waiting to see which — if either — of two ongoing bidders will buy them out of Chapter 11: Boca Raton, Fla.-based Pinalco, Inc. or an investor group headed by computer industry legend Harold Gessen.

Shop 'til you drop

Sage Software, Inc. shows no signs of slowing its 1989 shopping spree. Sage's latest buy: the exclusive worldwide marketing and development rights to Phoenix Technologies, Inc.'s overlay linker for MS-DOS, dubbed Pink86+.

Lease on life

Attention, computer leasing companies: Dataquest wants you. The San Jose, Calif.-based market research firm last week launched its Equipment Leasing Service, which will track approximately 200 product models from about 40 computer vendors to forecast future equipment values.

Slimfast paychecks

Approximately two-thirds of the employees at struggling database maker Sharebase Corp. (formerly Britton Lee) will be taking home slimmer paychecks between now and New Year's, the company said last week. The 10% to 15% salary reduction, expected to reduce operating expenses by about \$400,000, is part of an overall cost-containment move now in effect at the Los Gatos, Calif.-based company.

Almost all aboard

Safely reelected after the month-long threat of a proxy fight, the directors of Prime Computer, Inc. stayed in their seats long enough to elect the nominees of new Prime owner J. H. Whitney & Co. to the board, and then resign — except for one. John S. Dulansky became the sole representative of the old Prime board on the new Prime board. He is joined by chairman-designate Russell Plautner; Plautner's fellow Whitney partners Don Ackermann and Peter Castleman; and Spencer Lehman Hutton, Inc. Vice-Chairman George Steinberg, New Prime President James McDonald will climb aboard as soon as the merger is technically completed.

Global firms need new immigration law

BY J. A. SAVAGE
CW STAFF

Since most U.S. vendors operate globally, the success of their new designs and implementation often depends on engineers who are not U.S. citizens.

Last month, several legal organizations met in Silicon Valley to discuss how to grease the bureaucratic wheels of the Immigration and Naturalization Service (INS) to allow corporate access to the "best and brightest," no matter where their bodies may be.

Corporate immigration-related difficulties fall into two main categories: the need for predictability in the work force and the need for freedom of movement between countries where the company attempting to hire beyond U.S. borders operates.

Immigration provides one way for a company to get a competitive edge on the technology being developed in other countries. Mindful that "the U.S. is no longer the premier economy as we enter the 1990s," Zoe Lofgren, Santa Clara County supervisor and former immigration attorney, said a major change in immigration philosophy is needed before that opportunity can be realized.

"If the attitude is that we need remarkable people, rather than [that] we're doing these guys a favor, we need different laws," Lofgren said. Current immigration law allows U.S. corporations to sponsor qualified immigrant employees where U.S. workers are not available. There is a 54,000-person-per-year cap on such visas; moreover, half the allotted number go to immigrants who are sponsored by their families. The American Immigration Lawyers Association says the allotment is far short of current demand. Visas are also available to aliens of "exceptional ability" and for those who can labor in "proven shortage" occupations.

Lofgren said the reason why companies still have to struggle with immigration laws to get the "remarkable" people they need is simply arrogance on the part of the federal government, which she termed a "stupidifying bureaucracy."

In global strategy for U.S. corporations and the promotion of U.S. high-tech products in general, current immigration laws are a major barrier, Lofgren said. Immigration laws are "our trade barriers," and the Immigration and Naturalization Service (INS) is our "marketing department," she said.

Andre Rude, Hewlett-Packard Co.'s tax manager for expatriates, said that in the 20 years he has been working at HP, innovation in science and engineering is the area in which access to foreign employees has proven most important. "Having the employee with the most appropriate skills in the right place at the optimal time can make a difference in a successful project undertaken ahead of foreign competitors," he said.

For example, Rude said, a team of engineers that is working on the same project but is bifurcated between England and the U.S. has trouble meeting for any length of time to discuss the project and has to rely on late night and early morning phone calls or electronic mail. Matters would be greatly simplified, he said, if the whole team could assemble in the U.S.

High-tech companies have somewhat

of an advantage in recruiting foreign talent. "Immigration is already slanted toward providing visas for professionals," said James Ray, Varian Associates, Inc.'s corporate counsel. Yet, the attorneys' organizations are looking for 120,000 new visas to be created to eliminate the nearly year-long backlog in processing.

Predictability of business operations is a stumbling block for many global companies that rely on foreign talent. Maureen DeLege, immigration administrator at Seagate Technology Corp., said that the delays incurred waiting for visas have been devastating to the company. She

said that she cannot tell when a design team from the East will arrive for training because she is never sure if the paperwork will be done on time. She could bring people in early to compensate for expected delays, but at a cost of about \$3,000 per month per trainee. DeLege said, it is economically hard on the company.

Several categories of immigration are receiving attention on Capitol Hill, according to Warren Leiden, executive director at the American Immigration Lawyers Association in Washington, D.C. He said the current focus is mainly on the "new seed" category, where immigration

is not sponsored by a family. One subset of this category covers immigrants who can promise to create new jobs for Americans upon arrival. Leiden said there is also interest in raising quotas for highly skilled or specifically skilled immigrants. He is, however, less interested in a lottery for the immigrants and is leaning toward employer-sponsored immigration. With a lottery, the government "could just say, 'We let in 50,000 immigrants with masters degrees who are 27 years old. Now you [American companies] go find them,'" Leiden said.

"The INS and the State Department have to recognize that high-tech has a certain need," DeLege said. "If not, the U.S. will lose its position in the global marketplace."

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CW 88

Transform, Nastec eye CASE mart prize

BY STANLEY GIBSON
OF NEW

SOUTHFIELD, Mich. — Computer-aided software engineering (CASE) vendors Transform Logic Corp. and Nastec Corp. are hoping to do together what neither has been able to do alone — reverse the past year's losses and advance to the front ranks of the CASE market.

Late last month, the two firms said they will merge in an agreement that will make Nastec, based here, a wholly owned subsidiary of Scottsdale, Ariz.-based Transform Logic.

Privately held Nastec laid off some 30% of its work force early this year and is just short of breaking even, according to company officials. In the mid-1980s, the company emerged from the ranks of defense work as a commercial CASE pioneer; in the past several years, however, it has fallen behind such CASE players as Cambridge, Mass.-based Index Technology Corp. and Atlanta-based Knowledgeware, Inc., according to Ed Acly, a software analyst at International Data Corp. in Framingham, Mass.

Publicly held Transform Logic lost \$1.5 million on \$8.4 million in sales in fis-

cal 1988 and has lost \$1.5 million on \$3.8 million in sales in the first half of fiscal 1989, ended April 30.

An early wedding present could be on its way from Armonk, however. Transform Logic is under contract to IBM to create a version of IBM's Cross-System Product (CSP) fourth-generation language that will generate Cobol code. That new version is expected to be announced Sept. 18. In its first two quarters, Transform Logic's revenue from the IBM contract was \$1.4 million.

Nastec has voiced its support of IBM's CASE strategy and has said that it will

support CSP's external source format. Nastec is expected to participate in IBM's Sept. 19 announcement, which, it is anticipated, will also introduce the IBM repository.

"IBM's going to help everybody because everybody has been holding off," Acly said. The IBM repository will support CASE tools from a variety of vendors.

Steven Mann, president of Nastec and president-designate of the new company, said the new firm has no plans for employee layoffs and expects to be profitable within a year.

Corporate headquarters of the firm will be in Scottsdale. Transform Logic Chairman Gary Melara will remain at the chairman's post after the merger.

Girded

CONTINUED FROM PAGE 81

Although the two firms have long been associated, in recent years their financial relationship has dwindled considerably. Apple only accounted for 29% of Adobe's revenue for the first half of fiscal 1989, down from 84% in fiscal 1988. "We see no revenue impact whatsoever in the next year," said Adobe President Chuck Geschke, "and in 1990 we'll probably see an appreciable impact."

Apple's announcement came with an added psychological twist; it was Apple's first acknowledgment that clones could be considered as good as, or better than, Postscript. There are many Postscript clones now on the market, and speculation is ripe that Apple will license one or buy out a company that designs one.

Competition from Apple's font-encoding technology, Microsoft Corp.'s PM-Script, San Microsystems, Inc.'s Folio and the Postscript clones is clearly growing. Also, recent market research findings show Hewlett-Packard Co.'s Printer Command Language with more than 70% of the less-than-30-page/min. printer market to Postscript's approximate 20% (see story page 35). Nevertheless, analysts say Adobe is well-positioned for a fight.

"Anxieties over the Apple relationship are overblown," said David Nelson, an analyst with Sheraton Lehman Hutton, Inc. "Growth has been and will continue to be driven by the proliferations of PCs."

Still, analysts said the firm will need to plot a steady course for the rough waters ahead. "Eventually, PM-Script will probably be the standard in the OS/2 world, and the clones will nip at Adobe's heels, but those threats are long-term, say, in four years," said Kimball Brown, an analyst at Prudential-Bache Securities, Inc.

Meanwhile, Adobe will continue to expand its horizons. Two areas of growth look strong. First, Adobe has adapted its imaging model for printers to control fonts and graphics on computer monitors, which is a much larger market. Adobe is also eyeing the Japanese market, which trails the U.S. in office automation. That market is ready to accelerate in much the same way the U.S. PC market was in the early 1980s, and Adobe is making a strong push there. With more powerful PCs comes the need for more powerful graphics capabilities, and Adobe is already entrenched as a standard.

In any event, Adobe is clearly up to the challenge. "Our defense has been and will continue to be a great product," Warnock said. "It got us where we are today."

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Margolis

CONTINUED FROM PAGE 81

Three: The more confused you are, the better it bodes for Wang, Prime and their respective users and employees. The new breed of computer company executives seem superficially interchangeable because they're gunslingers, sent straight from Central Casting to save their founding firms. And in a climate in which there is increasingly an unspoken "show" preceding the word "business," in which image often supercedes reality to the point that it becomes reality, Central Casting — more so even than Harvard Business School or IBM — is the best place for a leader to come from.

This is not to disparage the financial managerial or technological talents of Messrs. Miller, McDonald, Craig and their kind. It is, rather, to note that they stand a serious chance of bringing off the awesome tasks they take on because, in addition to real abilities, they have the "look and feel" of leaders and winners.

"Everything is so superficial these days," a software executive lamented last week. "The computer industry is beginning to look like Hollywood, or politics. Image and momentum seem to matter more than the reality of products and people." True? Often. Bad? Not necessarily. The image vs. reality conundrum probably traces back to Adam and certainly has become an acknowledged element of American entertainment, politics and business — particularly as the lines between the three continue to blur. As the emphasis slides from the first word in the phrase "computer industry" to the second, we are fast losing the luxury of saying, "It can't happen here."

This is bad, however, only insofar as players in the industry fail — or refuse — to acknowledge it and persist in admirable but unavailing sentiments such as, "All we have to do is have the best technology, and it will sell itself," or, "Our chief executive officer is a superb technologist; he doesn't have to come on like a media star or a presidential candidate" (assuming there remains any difference). The industry is well into an era of turmoil and transition; now is no time to be an accidental purist. If you need a reminder, slap a Mondale For President sticker on your lab or office wall.

Talking to people about what lies ahead for Prime and Wang late last month, I didn't hear a lot of voices raised in worry about the companies' respective abilities as technological forces; on the contrary. What I did hear was a lot of concern about strategy, marketing, positioning and above all, image and momentum. "Prime has been so battered over the past months, I wonder if it can be perceived as a major company again," one analyst said. "Wang has taken such a heavy hit in momentum," noted another. "It will be a real challenge to get it back."

Nobody can know at this early stage whether the challenge will be met. What we do know is that both companies have bettered their comeback chances considerably with their choice of new leaders. Wang and Prime apparently have figured out that these days, in the computer industry as in other industries, a photo opportunity often is a shot at redemption.

Margolis is *Computerworld's* senior editor, industry.

NICKELS & DIMES

Businessland, Inc. announced record results for the fiscal year and fourth quarter ended June 30. The computer retailer said net income for fiscal 1989 was up 90% to \$32.9 million or \$1 per share, on a primary basis from net income of \$17.3 million or 64 cents per share for the same period last year.

For the fourth quarter ended June 30, net income of \$7.4 million (23 cents per share on a primary basis) was up 135% from net income of \$3.1 million (12 cents per share on a primary basis) for the fourth quarter ended June 30. Sales for the fourth quarter are up 21% at \$322.6 million compared with sales of \$266.9

million in the corresponding quarter of fiscal 1988.

Goal Systems International, Inc. announced revenue of \$16 million for the quarter ended July 31, a 31% increase over \$12.2 million for the same period a year ago. Net income for the quarter increased 20% to \$1.7 million.

For the quarter ended June 30, Anacom, Inc. recorded an operating profit of \$24.1 million on revenue of \$136.4 million. These results compare with an operating profit of \$17.1 million on revenue of \$100 million in the corresponding

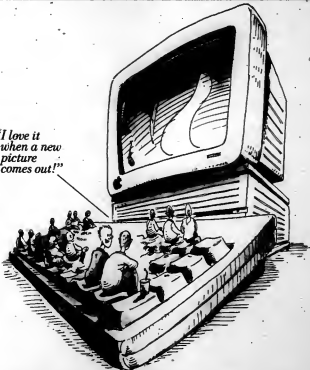
quarter of fiscal 1988.

Sage Software, Inc. reported results for the first quarter ended July 31. Compared with the first quarter a year ago, revenue increased 8% from \$4.5 million to \$4.8 million, and net income increased from \$63,000 to \$150,000.

CMS Enhancements, Inc. reported revenue for the quarter ended June 30 of \$42.8 million, an increase of 1% over the \$42.3 million reported for the comparable quarter last year.

Net income for the fourth quarter was \$1.2 million, an increase of 47% over the \$827,000 in net income before the FASB 96 gain reported for the same period one year earlier.

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COMPUTER CAREERS

IS pros can revamp operations

But don't count on business managers to be the company's visionaries

BY WALTER J. POPPER
SPECIAL TO CIO



In today's increasingly competitive economy, companies are focusing on revitalized operations as a primary means of boosting performance. Information systems are critical resources in this area.

Ask the operating manager to describe his goal and you get a common credo: to make the highest quality product or provide excellent service at the lowest possible cost in response to changing customer needs and with full attention to customer support. Cost, quality, flexibility and service are the dimensions on which operations judge their success.

In many operations, managers attempt to do well along all four dimensions. At the best-run companies, however, managers make a strategic choice and prioritize the four. They develop an operations strategy around these priorities and establish a frame of reference linking their priorities to the firm's marketing strategy. They then communicate their priorities throughout the organization so that the strategy will be well implemented.

For years, U.S. businesses have operated with the view that productivity is paramount and that economies of scale reduce unit costs. Operations managers who grew up in that environment have learned how to make trade-offs that maximize efficiency.

Today, however, the job of the operations manager is more demanding. With changes in government regulation, increasing global competition, fragmentation of traditional markets and proliferation of new product and process technologies, the operations manager must move beyond a pure cost or productivity focus, even beyond the paradigm of trade-offs.

The challenge is to aim for low cost and high quality. Operations must discover how improved quality can foster more efficient operations and thus lower the cost of production. The market demands quality, flexibility and service: The competition is delivering on demand, forcing radical changes in business as usual.

These changes have implications for IS professionals, particularly those assigned to support operations. In the past, this group has asked its clients—operations managers—who to assess information needs and then begun work on relevant systems:

forecasting, production planning, warehouse management and inventory tracking.

Unfortunately, what is required in operations today is not so simple. Ask the operating manager about his information needs, and he may respond from

who do the work are less than fully committed to a successful operation. At the extreme, they see themselves as mere extensions of the technology, lacking a creative role in the production process and unwilling to take responsibility for the output.

The alternative is to use technology to reverse the trend, providing information that allows operations people to expand their jobs and take on more responsibility. This way, information

is made with each new productivity campaign.

Again, there is an alternative: Approach cost control indirectly by addressing total quality management, total customer service or some other overriding goal. Provide the banner and slogan to inspire everyone and efficiency will follow.

Finally, there is a strategic risk—the danger of responding to local rather than global needs and achieving only limited results. When the warehouse runs more smoothly, an inventory system can be a success in the eyes of the distribution manager who sponsored it. However, pursuing that local objective might mean forgoing the greater opportunity to cut inventory radically, eliminate the warehouse and move toward just-in-time delivery. Only by looking beyond the client's perception and examining cross-functional business processes can the systems professional begin to identify big-picture opportunities.

When operations conducts business as usual, the result can be failure in the marketplace—unacceptable quality, unsatisfactory service, excessive lead times or uncompetitive prices. The systems professional who blindly relies on his client, the operations manager, to describe information requirements could be moving in the wrong direction.

Popper is a principal at Inter Group, Inc., a Cambridge, Mass., consulting firm.

ONLY BY LOOKING beyond the client's perception and examining cross-functional business processes can the systems professional begin to identify big-picture opportunities.

his own experience and historical perspective, with needs rooted in past procedures. Build the systems according to his requirements and you run the risk of replicating business as usual, or at best making incremental improvements. There are three specific types of risk inherent in following this course of action.

First, there is the risk of over-automation. The trend in many operations for years has been to subdivide tasks to achieve greater control and reduce costs. We sometimes automate repetitive tasks and replace costly direct labor with technology. The risk is that in an automated environment, work may become less meaningful. As a result, people

tion technology can support learning and adaptation to change. Systems become enablers of continuous improvement in operations.

The second risk is productivity paralysis. The more that operations managers focus on cost reduction and other productivity measures, the less likely they will attend to key long-term issues. An operation obsessed with cutting costs will miss opportunities for new investments in the plant, equipment, process research or quality control. The cost-control mentality also tends to drive out quality management. Employees and managers perceive a threat to their jobs and move quickly into a defen-

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MARKETPLACE

Searching for the right LAN

One tip is to circulate requests for proposals among vendors for critiques

BY AARON BRENNER
SPECIAL TO CIO

Buying a local-area network is not a simple proposition. There is no such thing as a generic LAN. Every company must tailor its network to its particular needs. Furthermore, LANs are not off-the-shelf products; they require expert planning, installation and service.

A request for proposals (RFP) can help on both counts — first by forcing information systems managers to delineate their needs and second by securing the best bid at the most reasonable price.

According to IS managers who write them and vendors who respond to them, an RFP for LANs comprises two parts: need assessment and vendor evaluation.

The heart of a needs assessment is a survey. With one, IS managers can develop profiles that describe computing at their company. One network consultant suggests profiles of users, usage, applications, hardware and geography.

A plethora of profiles

The user profile lists the business activity in each department. The idea is to guarantee that a

LAN is tailored to fit the business, not vice versa. This profile should give the IS manager a sense of how the LAN will help the company attain its goals.

The usage profile details computing activity, listing software, communications and outside services. It should be detailed and statistical, including peak usage periods for each activity. It should specify, for example, not just how often users print but also what they print, how much they print, how long it takes, what types of paper they use and whether they use special fonts.

The applications profile is a more detailed user profile. It should describe the tasks for which individuals or groups are responsible. The purpose is to depict how computing contributes to the achievement of business goals. This profile will help the IS manager with decisions concerning the pace, priorities, security and robustness of the network.

The hardware profile includes the configuration of computers, their memory, storage capacity and other peripherals. Again, detail is important. It should include serial numbers, micro-to-microframe protocols and keyboard templates.

The geographic profile is a

map of the company's computing activity, down to power outlets. Its purpose is to determine the network's physical needs.

The vendor evaluation is the heart of an RFP. Here, the IS manager sets out the requirements for the network and the

FOR THEIR OWN edification and to help control the bottom line, IS managers should ask vendors to let their proposals be submitted to rivals for second opinions. Some vendors may balk, but the idea makes sense.

vendor. The purpose is to invoke a response from the vendor that will meet computing requirements and business needs. By being tough, detailed and realistic, the IS manager can inspire innovative proposals.

There are hundreds of questions that might be put to LAN vendors on an RFP. To simplify the process, IS managers should break down the evaluation into two parts: network performance and vendor service.

The network performance section is for evaluating how well the vendor designs networks. How well does it put together hardware and software while tai-

loring them to customer needs? Does it guarantee compatibility with equipment in use and compliance with standards?

The service section should deal with the network's robustness and disaster recovery. What level of network uptime is guaranteed? What solutions are there for power failures, lightning strikes, user error and other data-destroying disasters?

Other questions deal with vendor resources. How many

helps at no additional cost, particularly if a bottleneck is attributable to the vendor's mistake.

One area that involves both network performance and vendor service is LAN growth. Since most networks grow faster than anticipated, vendors should provide plans for growth. This will demonstrate how well they design networks and whether they can service them.

Finally, for their own edification and to help control the bottom line, IS managers should ask vendors to let their proposals be submitted to rivals for second opinions. Some vendors may balk, but the idea makes sense. By circulating proposals among rivals, IS managers can get expert criticisms. Also, a vendor's critique can sometimes tell the IS manager more about the critic than the criticized.

Brenner is editor-in-chief of LAN Magazine and author of the book *OS/2 LANs*.

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The BoCoEx index on used computers

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	Closing price	Recent high	Recent low
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AT Model 339	\$1,850	\$2,000	\$1,700
PS/2 Model 50	\$1,675	\$2,000	\$1,600
PS/2 Model 60	\$2,700	\$3,200	\$2,500
Compaq Portable I	\$450	\$750	\$325
Portable II	\$1,700	\$2,000	\$1,650
Portable III	\$2,500	\$2,800	\$2,350
Portable 386	\$1,800	\$2,000	\$1,600
Pico	\$900	\$1,300	\$900
Deskpro 386	\$1,950	\$2,350	\$1,700
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Apple Macintosh 512	\$400	\$650	\$300
512E	\$625	\$925	\$600
Pico	\$1,025	\$1,150	\$750
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TRAINING

Promoting self-sufficiency

These five steps can help free IS groups from routine support of PC users

BY NAOMI KARTEN
SPECIAL ADVERTISING SECTION

Information systems organizations are inundated with an ever-growing demand for end-user support. However, they cannot keep throwing bodies at the problem. One way to reduce the demand is to teach users to be more self-sufficient. The following five techniques can help IS organizations to strengthen users' self-sufficiency and keep the demands on their own limited resources from escalating.

Teach problem-solving techniques. Teaching how hardware and software are supposed to work is only half the job. Many users automatically reach for the phone when something unexpected happens because the process of debugging, so familiar to IS developers, is foreign to them. Yet, in some cases, the solution to a problem is only a few keystrokes away and is less involved than seeking help. Unfortunately, IS trainers who do not expose users to problem-solving techniques may be inadvertently sending a signal that it is all right

to depend on IS professionals to resolve any problem.

When users do require assistance from IS, the ones who have learned some troubleshooting techniques are better prepared to give the IS staff clues that can help resolve their problem.

Orient training to business needs — carefully. The greater the overlap between training in a technique and its use by the student, the more likely the training will be retained. Also, when training is relevant, users are less dependent on IS for support.

IS trainers must be careful, however, to avoid a potential pitfall of business-oriented training that can make users more reliant on IS assistance.

Some users who study the solution to a specific business problem become stymied when transferring the knowledge to other issues. It is important to help users learn how to apply product techniques to a broad range of problem.

Develop departmental product specialists. "Key user" programs have long

helped some IS organizations manage the demand for support. They require each user department to designate someone to serve as the first source of support. The IS organization then supports the specialist rather than the entire department. However, the results of this ap-

IS TRAINERS who do not expose users to problem-solving techniques may be inadvertently sending a signal that it is all right to depend on IS professionals to resolve any problem.

proach have fallen short of needs in some organizations for two reasons. One is lack of time — most specialists are expected to provide technical support in addition to other responsibilities. The second is the burden of learning about all the products a department uses.

An alternative is for each department to create a small group of specialists, each with responsibility for one or two products that relate most closely to their

work. This reduces the time burden and enables each specialist to develop in-depth knowledge of a particular product. There is an additional advantage to this approach; there is less impact on the department and, therefore, less demand on the IS group when a product specialist leaves.

Teach soup-to-nuts application development. Most user training focuses on product features and functions. However, too great an emphasis on these mechanics can leave users

experience in the classroom through a well-planned case study, a systems perspective will become second nature.

Establish a service-level standard. It would be difficult to argue against users depending on IS support if the standard were readily forthcoming. But most IS organizations face rapid growth in the number of users, products supported, complexity of applications and sheer volume of computing.

However, there has been no evidence of a comparable increase in IS staffs to manage this growing demand. Establishing service-level agreements can help promote self-sufficiency and let IS put its existing resources to use most effectively.

A service-level agreement is a negotiated accord between IS and users. Its purpose is to create a common understanding about the services IS will and will not provide, the priorities that will apply and how responsibilities will be divided among users and IS. Many organizations already have service-level agreements between data center operations and users.

Karten is president of Karten Associates in Randolph, Mass., and editor of the monthly newsletter "Managing End-User Computing."

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September 11

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September 18

Developing the information systems staff as trainers, mentors and coaches

September 25

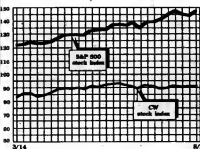
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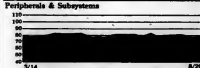
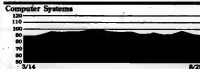
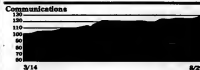
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TRAINING PAGES

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STOCK TRADING INDEX



<i>Indexes</i>	<i>Last Week</i>	<i>This Week</i>
Communications	127.3	130.0
Computer Systems	92.4	91.8
Software & DP Services	111.7	113.0
Semiconductors	56.0	55.9
Peripherals & Subsystems	77.6	79.2
Leasing Companies	125.8	121.6
Composite Index	90.8	90.9
S&P 500 Index	143.8	147.4



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUG. 26, 1992

Communications and Network Services

[illegible]

Computer Systems

[illegible]

Software & DP Services

[illegible]

Semiconductors

N	ADV MICRO DEVICES INC	12	7	8.379	-0.8	-3.8
N	ANALOG DEVICES INC	13	10	10	-0.1	-1.2
Q	ANALOGIC CORP	11	7	8.8	0.8	2.7
N	CHIPS & TECHNOLOGIES INC	28	11	32.76	0.8	1.7
N	ATTEL CORP	22	16	38.36	0.8	1.7
N	LSI LOGIC CORP	26	16	8.75	0.0	0.0
N	MICRON TECHNOLOGY INC	60	13	14.29	-0.8	-3.4
N	MOTOROLA INC	63	38	58.875	1.9	2.2
N	RAI SEMICONDUCTOR	11	7	7.75	0.1	1.8
N	TECH INC INC	10	8	38.875	0.8	1.7
A	WESTERN DIGITAL CORP	10	9	9	-0.5	-0.8

Peripherals

[illegible]

Leasing Companies

Q	AMPLIFON INC	115	31	14.3	1.5	7.4
N	CAPITAL ASSOC INT'L INC	6	0	8,375	-0.8	-164
Q	CAVCO INC	3	19	36	0.4	1.8
D	CONTINENTAL INFOSYS	6	4	0.75	6.2	5.2
Q	LDI CORPORATION	17	13	16.75	0.8	1.8
Q	PHOENIX AMERICAN INC	6	3	4,125	-0.1	-2.4
Q	SELECTRA INC	8	8	7.25	-0.8	-4.8

Summer slack

September slows tech shares as investors catch their breath

The end of August brought a breather to the frenetic pace that has marked the technology market recently; investors slowed their trading activity and took a break from the hot and heavy action of the past few weeks. Ashton-Tate Corp. led the winners, finishing Thursday at 12%, up 1½ points. IBM gained 1 point to close at 117½; Collins Software, Inc. finished at 8½, up ¼ of a point; and Computer Associates International, Inc. added ¼ of a point to close at 17.

On the other side of the ledger, Stratus Computer, Inc. dropped 21 points to finish at 32% as rumors of an IBM buy-in faded; Sequent Computer Systems, Inc. slid 14 points to close at 29%; and Digital Equipment Corp. fell 2 points to end at 100%. Meanwhile, MAI Basic Four, Inc., no longer pursuing Prime Computer, Inc., continues to pay for its ill-fated acquisition attempt. MAI closed at 4%, off 1/4 of a point. Prime ended the week down 1/4 of a point at 11%, nearing its lowest level of the past year.

Other shares that finished the week slightly lower included Data General Corp., Sun Microsystems, Inc. and Compaq Computer Corp. Data General slipped $\frac{1}{4}$ of a point to close at 15 $\frac{1}{2}$, Sun finished at 15 $\frac{1}{2}$, off $\frac{1}{4}$ of a point, and Compaq dropped $\frac{1}{4}$ of a point to close at 91.

JOSEPH J. FATTORI

Sprint jumps on ISDN wagon

BY ELISABETH HORWITT
CIVIL

KANSAS CITY, Mo. — U.S. Sprint Communications Co. has at long last followed AT&T into the Integrated Services Digital Network (ISDN) arena with a Primary Rate Interface service offering. However, according to one analyst, like AT&T's year-old announcement, it is an "anemic imitation" of true end-to-end ISDN.

Both carriers are offering call-by-call ISDN access to their existing communications services, allowing users to dynamically reallocate the 23 64K bit/sec. B channels in an ISDN link according to changing traffic needs. This "rich man's ISDN" primarily provides line cost savings to a few large companies that currently use at least three T1 lines to access a wide range of carrier services, according to Thomas Nolle, president of Radonfield, N.J.-based consulting firm CIMI Corp.

Another drawback of AT&T's and Sprint's initial ISDN offerings is that they require users to set up dedicated T1 connections to the carrier's premises, which is expensive and

effectively anchors the user to a particular carrier's services. True end-to-end ISDN, which would include ISDN from the local carrier, would allow users to select services dynamically from different carriers, Nolle said.

The U.S. General Services Administration is pressing the divested Bell operating companies to use Signaling System 7 and ISDN so their users can have end-to-end ISDN connections, said Michael Corrigan, deputy commissioner of telecommunications services. However, ISDN services are not part of the initial Federal Telecommunications System 2000 contract.

Other abilities

Will end-to-end ISDN, users would also be able to exchange call-related information and packet-switched data on a separate D channel, Nolle said. The ability to send packet data as an adjunct to the main ISDN lines could greatly boost the viability of packet switching as an inexpensive long-distance communications service, he added.

Sprint made much of the fact that its ISDN service, unlike AT&T's, will provide access to packet-switching services, spe-

cifically from Sprint's value-added network subsidiary, Teleset Communications Corp. AT&T has not yet launched its ISDN service to its Accuport packet-switching service, "because customers have not said they want it," AT&T spokesman William Weiss said.

West Virginia University, which currently uses a Centerline ISDN service to connect its campus users, would like to see "an ISDN packet network that would connect us to other places in the country, from one ISDN island to another," said Jeffrey Fritz, a data communications analyst at the university.

Sprint is not, however, providing inexpensive ISDN-based packet-switched transport on the D channel, but only access to Teleset's non-ISDN packet-switched network via a 64K bit/sec. ISDN B channel. While the service is said to cost less than dedicated 64K bit/sec. access, most users do not need full 64K bit/sec. lines to carry packet-switched data, Nolle said.

Before end-to-end ISDN is possible, carriers such as AT&T and Sprint must fully deploy Signaling System 7, which defines how ISDN information is carried

on the D channel. Sprint has done this, and AT&T will have completed the job by year's end, Weiss said.

A more difficult prerequisite for true ISDN is for carriers to equip their switching sites with special computer hardware that can handle the wealth of ISDN D channel information separately so it will not bog down the main network, Nolle said. This requires an expensive, ad-hoc

once network conversion to ISDN users can communicate with enough other users to make it worthwhile.

A likely candidate for providing the first true ISDN network is MCI Communications Corp., which has indicated it will make its own ISDN announcement by late this year or early next year, Nolle said. "They need to make a big splash in order not to look like also-rans," he said.

WCC convenes in Calif. to track technology

BY JEAN S. NOZMAN
CIVIL

SAN FRANCISCO — Though the dawning pace of the computer world keeps accelerating, the World Computer Congress meets but once every three years. Last week, 1,900 international delegates of the International Federation for Information Processing convened here — just 30 miles north of Silicon Valley — to debate the use of supercomputers, databases and artificial intelligence.

There was precious little disagreement on technology, but global differences cropped up in implementation.

"For the most part, it doesn't matter whether you're Chinese or Russian, the technology remains the same," said WCC program director Herve Gallaire, who is also managing director of the European Computer Industry Research Center in Munich. "It's just that you might be at a different stage in using the technology, depending on where you live."

WCC organizer Stephen Yau, chairman of the computer science department at the University of Florida in Gainesville, agreed.

"It's the end-user applications that differ from country to country," said Yau, who chaired Northwestern University's computer science program during the 1970s and early '80s. "Office-automation applications would vary widely, but computer technologies are equally applicable."

have offered."

The intent is to clear doubts about whether CASE vendors will be able to work with the repository, one vendor said. By making its direction clear, IBM can allow users to begin working on various parts of the AD/Cycle architecture and connect to anticipated components such as the repository when they are available.

Leading-edge shops conditioned to information engineering tools have already developed a mind-set that will enable them

to live in every country."

Between congresses, users said they track emerging technologies — and each other — by logging onto global networks. "If you're not on a network, you're out of it," said one Stanford University researcher. "That's where we get new ideas and find out what's going on at other universities."

Some say such electronic advances have cut into the WCC's impact on worldwide research.

"When this congress began, in 1959, it was among the first computer conferences," commented one West German computer scientist. "Since then, conferences have proliferated, and it has become more of a place to meet your colleagues in computer science face-to-face."

During the week-long meetings, delegates listened to dozens of computer-science research papers and participated in panel discussions in 11 major "tracks."

The keynote speaker, Hewlett-Packard Co. Chief Executive Officer John A. Young, stressed the need for international computing standards as an entryway to a new world of distributed computing.

"Standards won't lead to sameness in the computer industry," Young said. "They'll usher in a whole new richness and variety and usefulness of computer solutions available. Standards define the interface [between hardware and software]. They don't define how you implement it."

to use the repository along with third-party tools immediately, Hennessey said. However, he said, "Ideas that haven't developed the mind-set will not be able to take advantage no matter how good the third-party tools."

"There's a lot of positioning that organizations need to do to get themselves going for it," said another vendor.

"People are saying they are postponing purchases while they wait for the repository. IBM will say 'Don't wait, start today,'" one vendor said.

IBM

FROM PAGE 1

will CASE tools be able to work with it.

Indeed, Hennessey said that a working version of the repository will receive enhancements over time, much as DB2 has experienced.

Although some 20 vendors are expected to line up in support of AD/Cycle, three of those

— Index Technology Corp., Knowledgeware, Inc. and Bachman Information Systems, Inc. — will occupy center stage at the announcement, said sources at third-party vendors expected to take a secondary role in the announcement.

Hennessey said that the three vendors will be IBM partners in the infrastructure and that he believed that "Knowledgeware's data model will be used as the primary way of getting anything out of the repository."

Nevertheless, the three vendors will reportedly demonstrate their products running atop OS/2 Extended Edition with no SAA Presentation Manager user interface.

Although that will add weight to OS/2 Extended Edition as the favored AD/Cycle development platform, IBM will reportedly also support terminals for AD/Cycle as well.

Eldon Paterson, director of research and development at Texas Instruments, Inc., said

that his company would be issuing a press release. However, he declined to offer particulars.

A scenario echoed by an insider at Integral Systems, Inc. Another vendor's spokesman, who requested anonymity, said that IBM has only divulged information to the majority of third parties recently. "We are working on a real short cycle on this thing," he said.

Also on center stage will be

BY MAKING ITS DIRECTION CLEAR, IBM should allow users to begin working on various parts of the AD/Cycle architecture and connect to anticipated components, such as the repository, when they become available.

IBM's Cross System Product (CSP). Several sources indicated that it is likely that the Index, Bachman and Knowledgeware products will be demonstrated interfacing with CSP's External Source Format, which can accept information from various CASE tools. Formerly referred to by IBM as a fourth-generation language, it will be stressed as an applications generator instead.

IBM is known to have been working with Transform Logic, Inc. in Scottsdale, Ariz., on a version of CSP that will generate Cobol code. Although CASE vendors said it is likely that a new version will be announced, they

were unclear as to how complete that version will be, or when it will be available.

One vendor stressed that the announcement will be architectural in nature and will set forth the strategy and a time frame for IBM to introduce AD/Cycle products over the next two years. IBM's rule of thumb is to set a two-year window for SAA-compliant products to be announced and shipped. The ven-

dor indicated that IBM is following that time frame with its AD/Cycle announcement.

"IBM will announce some specific dates and the intention to announce dates," a vendor said.

George Schussel, president of Digital Consulting, Inc., said that a conceptual announcement would commit IBM to delivering products and would also give organizations time to digest the implications behind the concepts. IBM's development environment, he added, "is quite different from the approaches to the application development life cycle that most other vendors

RT systems may be late for the gate

BY AMY CORTESE
CW STAFF

IBM's new family of Units-based RT workstations is waiting in the wings, but those betting on an October announcement may be disappointed.

An IBM spokesman said last week that the company was considering a number of announcement possibilities for the family of workstations and multitier systems, including later this year and the first quarter of next year, but he declined further comment.

Robert Simko, executive director at International Technology Group, a market research organization in Los Angeles, Calif., said IBM was positioned for a fourth-quarter introduction but decided last week to postpone it so that "everything would be in place" — namely, supporting software applications from third parties as well as field support.

IBM is working with a cadre of business partners to provide a portfolio of software applications spanning engineering to business applications, according to Simko and other analysts. IBM has not publicly stated a date for the introduction of its long-awaited next-generation RT. In an interview with *Computerworld* last year, however, Nick Donofrio, an IBM vice-president and president of the firm's Advanced Workstations Division, said an RT follow-on with improved hardware and software would be forthcoming in 1989.

It had been widely speculated that IBM would make the announcement Oct. 17; according to one source, "the rooms were rented."

The RT follow-on is expected to include a number of systems — ranging from desktop to floor-standing models to a rack-mounted model — rating "upwards of 30 million instructions per second," according to Simko. The systems will run a

new release of the AIX operating system on which the Open Software Project will base its OS/1 offering.

The significant improvements to the RT hardware architecture and operating system should boost IBM's standing in the contested Unix workstation market, but software applications will be key.

IBM has learned from past experiences that available software applications are all-important. The company's heralded 9370 fixated when software applications designed for IBM's mainframes proved difficult to run on the scaled-down machine. In contrast, the Application System/400 was an immediate success because of the large supply of software programs ready to run on it.

As it is, there is very little software written for AIX, and the applications that exist are not likely to be compatible with the significantly enhanced new systems. IBM has said that the follow-on will not be object-code-compatible.

Jim Starkey, president and founder of Bedford, Mass.-based Interphase Corp., said, "What it means for users is that none of the software they've bought will run on the new RT's." Starkey said his firm has not released the RT version of its Interphase database management system because it will be made obsolete by the follow-on systems.

However, if IBM delivers on its promises and expectations are met, "people will ignore the pain of migrating," according to Lou Lipiczyk, a Unix workstation user and vice-president at Salomon Brothers, Inc. in New York.

Some say the incompatibility is a moot point. The RT's do not have a large installed base, and there is little software available for today's RT's, said David Card, an analyst at Framingham, Mass.-based International Data Corp.

Convicts' PCs kept on ice for now

Officials say ban on computers in prison is under reconsideration

BY J. J. SAVAGE
CW STAFF

MONROE, Wash. — Inmates at the Washington State Reformatory were given some hope that they can get back the use of their personal computers. However, they did not get a promised definitive decision on PC use.

It was in late July that their prison officials eliminated the only program of its kind in the U.S., which allowed inmates to have PCs in their cells. The inmates, who had bought the computers with their own funds, had to ship them out of the facility or risk confiscation by authorities [CW, July 24].

Prison officials decided to re-

consider the removal of the PCs, and an account executive at Sun Computers, Inc., a Bellevue, Wash.-based computer dealer, is conducting a study of the situation.

Prison officials "know a lot of good things we don't do through the program, and they don't want to see it lost, but there are security risks involved," said Sun Computers' Jim Thomson, who has worked with the Department of Corrections on other technology projects.

Thomson, who has volunteered his time to make recommendations to prison officials about how to structure the program to avoid abuses, He would not say when the study will be

finished, however.

The prisoner PC program was launched by inmates as a way to develop skills needed to succeed on the outside. They claimed that the program was having a positive impact on recidivism for these inmates who were involved — about 10% of the prison population.

Prison officials cited security problems because guards found it difficult to access information stored on the computers; the value of the computers also made them a financial liability for the prison if they were damaged by prison staff.

However, some prison officials also cited a positive effect on the inmates; the convicts had to keep an exemplary record in order to qualify for, and keep, the PCs.

IBM to bolster AS/400 with midlevel systems

BY ROSEMARIE HAMILTON
CW STAFF

IBM is expected to give its Application System/400 minicomputer line another boost this week with the announcement of two midrange models and several key software and peripherals enhancements.

The package is aimed specifically at IBM System/36 users, who have not been migrating to the new midrange platform as quickly as IBM would like, observers said last week.

An IBM spokesman confirmed that a midrange press briefing has been scheduled for tomorrow.

Analysts expect IBM to introduce two systems that would lower the entry point for the rack-mounted models. System/36 users typically migrate to the middle of the AS/400 line rather than starting off with the high-performance AS/400s, which have performance comparable to a

older System/36.

The AS/400 line is actually split in two, with Models 10 and 20 representing the low end and rack-mounted models 30 through 80 making up the middle and high ends.

"It looks like they'll expand main memory and offer a 20% performance improvement, and that looks like they'll replace the [Models] 30 and 40," said Tony Membrino, a leasing analyst at IDC's Financial Services Corp. in Framingham, Mass.

IBM is also expected to make good on several promises from earlier this year. For one, observers expect to see a new tape-drive product.

"The tape drive has been a long-standing issue, and we're cautiously optimistic that the tape-drive trial of years will finally end this fall," said David Andrews, president of ADM, Inc., a consulting firm in Cheshire, Conn.

Earlier this year, Steven

Schwartz, vice-president in charge of IBM's Application Business Systems division, said the company would improve the current tape drive, the 2440, and announce a new tape drive by year's end. Recently, IBM announced a 2440 enhancement.

Also, IBM will likely officially introduce OS/400 Release 2, which reportedly offers new security features. IBM officials have acknowledged that many System/36 users have complained that the new midrange system is not as easy to use as its predecessor. The company has said that it would incorporate more simple procedures into the AS/400 operating system to make it more like the System/36.

Observers also predicted that a C compiler, a key component of the AS/400's role in IBM's Systems Application Architecture (SAA) strategy, will be introduced. IBM has committed to providing all SAA hardware platforms with a C compiler.

The C compiler could also greatly expand the software offerings for the AS/400.

"End users aren't waiting for this, but in the long term, it's very important," Andrews said.

CORRECTIONS

In "Andahl follows NAS case on ESA stage" [CW, Aug. 7], the ship dates in the story (October for the 5400 and January for the 5990) are for volume shipments. First shipments are slated for this month and the fourth quarter, respectively.

The Andahl implementation of ESA does include two "extras" over IBM's implementation: a Private Space Facility on both models, which allows new data spaces to exist in harmony with older datasets, and a larger Access Register Translation Lookaside Buffer. Andahl would not quantify how much larger the buffer is than IBM's offering.

An item in Linda Lines [CW, July 17] incorrectly stated that Hewlett-Packard Co. is developing Merit/BSI, an implementation of Unix. HP is co-marketing that product, which was developed and is being supported by Mt. Xinu in Berkeley, Calif.

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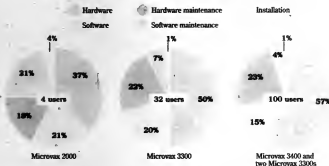
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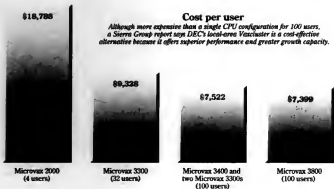
Figures represent how much Microvaxes will cost over a five-year period.

Percent of system costs
Total hardware and software expenditures trend in opposite directions as system size increases. Hardware and its maintenance account for more, while software expenses drop.



Cost per user

Although more expensive than a single CPU configuration for 100 users, a Sierra Group report says DEC's local-area Vaxcluster is a cost-effective alternative because it offers superior performance and greater growth capacity.



SOURCE: THE SIERRA GROUP, INC.

BY CHARTS: FRANK C. COCCHELLI

NEXT WEEK

Centralizing IS in a ▶ decentralized company posed technological and cultural challenges for General Signal's director of operations systems, Stefan Gladyszewski. The \$1.7 billion diversified manufacturer is consolidating processing for nearly 20 business units into two data centers. A report on the project appears in Manager's Journal.



THE SHANNONBLACK STAR

Do you know the biggest complaint that IS professionals have about their jobs? Hint: It has to do with how they're managed. *Computerworld's* third annual Job Satisfaction Survey reports the one message IS pros would most often pass along to top management along with other revelations. IS managers comment in follow-up remarks.

INSIDE LINES

Not quite Terminator II, but close

Friday was the day "Robo-Cop" was unleashed at Wang Laboratories, and heads are already rolling, said a source tapped into Wang. Nervous employees there have apparently tagged the Robo-Cop label to Richard Miller, Wang's new president. Reports filtering out of Wang's Lowell Towers last week indicated that Miller has already begun to hack away at Wang's dense undergrowth of middle management. At least one vice-president and a number of people in the finance department were said to have been terminated.

Bundling up complaints

At a recent meeting, DEC officials listened to complaints from Software AG, Oracle and Sybase concerning DEC's bundling of its RDB DBMS with its VMS operating system. The software firms, on behalf of Adapco, charge that the action is anticompetitive and are asking DEC to reverse its move and price RDB separately. The DEC representatives told the software firms they'd have an answer by the end of the month.

A likely turn of events

Compaq has been silent on any plans for PCs using Intel's 80486, but at least one investment firm speculates that the company will introduce three 486 configurations this year. According to a Prudential-Bache Securities weekly newsletter for investors, Compaq is readying a single-user model with an AT bus and two server workstations each with an Extended Industry Standard Architecture bus.

When will they ever learn?

"Poor security practices contributed to the spread of the virus on Internet last year, and those practices are still there," says Eliot Solner, chief of the office of standards and commercial product evaluations at the National Computer Security Center. The center is a branch of the super-secret National Security Agency that focuses on computer security. Internet users have not learned from the incident and remain lax in protecting their systems, Solner said. "Everytime we get a new access, but there has to be a balance between ease of operation and reasonable control," he warned.

AIX: An IBM eXodus

As IBM prepares, maybe, for a major rollout of AIX systems, top AIX executives continue to roll out the door as well. An IBM spokesman confirmed last week that Clay Capione, director of AIX Systems, has left to become a vice-president at Mead Data in Dayton, Ohio. Capione had replaced Daryl Wartluft a year ago when the former AIX Systems director left IBM to join Honeywell Bull. Other erstwhile AIX notables include Stephen Lowen, chief marketing officer at X/Open, and Arthur Goldberg, president of Atherton Technology.

Get ready to wipe the slate

DEC's page-level locking, which can slow performance in very high-transaction applications, will be changed to the more efficient row-level locking, probably with Release 2.3, a DB2 consultant said. IBM has indicated it is working on the change but couldn't say when it will be implemented. Release 2.3 should be announced before year's end, the consultant said. Meanwhile, Release 2.2 will ship in a few weeks, IBM has said.

Not mucky, just ducky

3Com founder Bob Metcalfe dismisses comments about his firm's relationship with Microsoft eroding as "unreliable and unfriendly rumors." Microsoft has indicated it will consider alternative forms of distribution if LAN Manager OEMs, 3Com's responsibility under a joint partnership, can't establish a beachhead by mid-1990. Metcalfe says there are 40 LAN Manager OEMs, including 3Com and IBM: "3+Open is widely available, and if anyone can't find it, they should give me a call."

Your monthly scribble's ears were burning after reading letters to the editor on page 20 in this issue. Then he figured, "If I can do it out, I can take it in. I can always sting it back." So serve up your juiciest one-liners and other scathing news items to News Editor Pete Bertels at 800-343-6474 or 508-879-0700; if you're looking for pampering platitudes, this is not the page to turn to.

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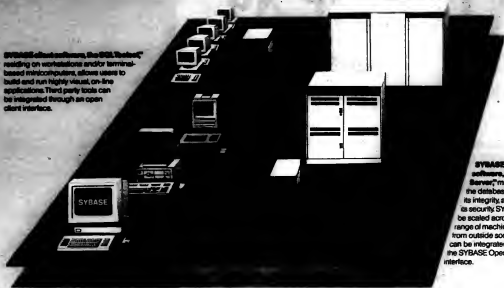
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